



● The Economic Burden of Unintentional
INJURY
IN ATLANTIC CANADA



presented by



SMARTRISK



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The Economic Burden of Unintentional Injury in Atlantic Canada

Report prepared for



Atlantic Network for Injury Prevention

by

SMARTRISK™



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The Economic Burden of Unintentional Injury in Atlantic Canada
based on the study *The Economic Burden of Unintentional Injury in Canada* by SMARTRISK
Study conducted by The Hygeia Group: Terry Albert and Eden Cloutier

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EXECUTIVE SUMMARY

Every hour of every day, 36 people in Atlantic Canada are unintentionally injured (over 860/day), roughly 2 people in Atlantic Canada die daily from these injuries and almost 6,700 are disabled every year. Overall, almost 316,000 residents of Atlantic Canada are injured each year. While doubtless, the greatest impact of these injuries is in terms of human pain and suffering, they also have a societal impact in terms of cost. The people of Atlantic Canada need to know how much unintentional injury costs. The Atlantic Network for Injury Prevention (ANIP), with funding support from Royal & SunAlliance and Health Canada, commissioned this study to determine the health care costs and other societal costs associated with unintentional injuries and to bring this public health issue to the forefront of public policy.

In 1999 preventable injuries cost the people of Atlantic Canada \$1.2 Billion or \$489 for every citizen. Falls accounted for \$440 million or 38 per cent of the total amount. Motor vehicle crashes cost \$210 million or roughly 18 per cent of the \$1.2 Billion. The remaining 44 per cent of total costs can be attributed to a combination of costs incurred by poisoning, drowning, fires, and a range of other injuries not specified by hospital classification systems. On average, each injury generates about \$3672.72 in direct and indirect costs.

The results of this study highlight a crucial issue. If these injuries are largely preventable, then how much more money and how many more lives could Atlantic Canada save by enhancing existing strategic prevention programs? To demonstrate, the study offers examples of prevention strategies showing the extent to which Atlantic Canada could save money and lives.

Acknowledging the need to act is the first step. The next step is to bring together the key players and stakeholders to devise, resource and operationalize strategies in each Atlantic province. The rationale is clear. Unintentional injuries cost Atlantic Canada \$1.2 Billion. The consequences for not acting are far reaching for this significant health and societal problem. This is a challenge requiring a truly integrated response involving a partnership between provincial governments, the federal government, non-governmental, regional and community-based organizations involved in injury prevention and control. The key to success is to recognize that we can tackle this problem and achieve great results together. We must challenge this health and societal threat in Atlantic Canada. Together we can make the difference!

INTRODUCTION

Canada has been experiencing a silent epidemic for many years. It is not cancer or heart disease. It is an epidemic of unintentional injury. Injuries are the leading cause of death for Canadians between the ages of 1 and 44 and injuries are the fourth leading cause of death overall for Canadians of all ages (Statistics Canada data for 1998). Injuries are a major cause of premature mortality and disability in Canada. Fatalities and disabling injuries often strike down adolescents and young adults. Injury is the second leading cause of Potential Years of Life Lost in Canada before the age of 70 (Calculations by the Injury Section, Health Canada using Statistics Canada data for 1998). In an international comparison of injury deaths (mortality rates) in developed countries, Canada ranked 7th highest for all injuries (Fingerhut et al, 1998). The Atlantic Provinces of New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island are no different from the rest of Canada in terms of the relative size of this critical public health and societal issue.

Although the greatest cost of injury is in human suffering and loss, the financial costs are far from trivial. A landmark study unveiled the staggering costs of unintentional injury in Canada amounting to some \$8.7 billion (SMARTRISK, 1998)¹. Nationally, in 1998, injury ranked fourth behind cardiovascular disease, musculoskeletal disease and cancer in terms of societal economic burden. Yet injury research attracted less than one per cent of the total health research expenditures that same

year (Health Canada, 2002). Injury remains a predominantly hidden epidemic. But it is a silent epidemic because, generally, people do not see the risk in their everyday lives. If they do not see the risk, they cannot take measures to navigate that risk in order to prevent potential injury. Why can't we see the risk in our lives?

The problem stems from a universal misunderstanding and misuse of the word 'accident.' Injuries sustained by falls or motor vehicle crashes are not seen as the result of predictable events but rather to be the result of 'accidents' or 'acts of fate'. Yet when someone suffers from heart disease or cancer, high cholesterol and smoking are identified as possible predictable causes. To make a significant impact on injury, we must first acknowledge that injuries are predictable and preventable. Injuries are not accidents, and investing in injury prevention can save money and lives.

There are two categories of injury: unintentional and intentional. Unintentional injuries, which are very responsive to prevention, include those due to falls, motor vehicle crashes, drowning and suffocation, poisonings and fires, as well as pedestrian, cycling, and railway injuries. Intentional injuries and death result from homicide, acts of interpersonal violence, and intentional self-inflicted injuries or suicides. The current report focuses exclusively on unintentional injuries.

TABLE 1

Summary of Unintentional Injury Findings
Atlantic Region, 1999

| Injury Deaths | Hospitalization Injuries | Non-Hospitalized Injuries | Total Injuries | Injuries Resulting in Partial Permanent Disability | Injuries Resulting in Total Permanent Disability | TOTAL ANNUAL COST |
|----------------------|---------------------------------|----------------------------------|-----------------------|---|---|--------------------------|
| 682 | 18,012 | 297,059 | 315,753 | 6,201 | 471 | \$1.2 Billion |

¹ *The Economic Burden of Unintentional Injury in Atlantic Canada* is based on a more comprehensive review of the literature which is available from the SMARTRISK Web site: www.smartrisk.ca/research/burden.html

Often the terms “injury prevention” and “injury control” are used when describing what needs to be done to reduce this burden. Injury prevention involves ongoing strategies, operations, and programs designed to eliminate the occurrence or reduce the severity of injuries at the time of occurrence. Whereas, injury control includes prevention as well as emergency medical services, acute care, and rehabilitation designed to minimize the effects of injuries once they have occurred.

Other countries have recognized injuries as a major threat to human health and well-being and they have devised action-oriented responses. The United States now has a National Centre for Injury Prevention and Control (Sleet et al., 1998) and the British government has recently identified injury as one of four health priorities along with heart and stroke, cancer, and mental health (Department of Health, 1998).

THE ATLANTIC CONTEXT

Many organizations, both government and non-government, have been working collaboratively toward the reduction of the incidence and severity of many types of injuries in each of the four Atlantic Provinces. Late in 2000, a group of these people came together to form the Atlantic Network for Injury Prevention (ANIP). The purpose of ANIP is to provide opportunities to facilitate collaboration and coordination in injury prevention activities within Atlantic Canada in the following areas:

- Policy Development & Advocacy
- Surveillance
- Program Development, Evaluation & Resources
- Research
- Awareness & Education

The ultimate goal is to reduce the burden of injury in Atlantic Canada. We want the people of Atlantic Canada to understand that injuries kill and disable people every day. We want them to understand that injuries can be prevented and that currently injuries cost Atlantic Canadians a great deal of money. ANIP, with funding support from Royal & SunAlliance and Health Canada, commissioned a study on The Economic

Burden of Unintentional Injury in Atlantic Canada to determine the health care costs and other societal costs associated with unintentional injuries and to bring this public health issue to the forefront of public policy.

This report goes beyond the economic consequences of injury. It proposes solutions to reduce human pain, suffering and grief through provincial strategies that would enhance each province’s existing investments, policies and programs in injury prevention and control. A comprehensive strategy must take into account the range of programs that currently exist along the continuum of injury prevention and control. It needs to describe the injury problem through surveillance, study the factors that increase or decrease the risk for injury, design and evaluate intervention strategies that target these risk factors, and take steps to ensure that proven strategies are implemented in communities in each province and across Atlantic Canada.

This report also recommends developing new capacity to implement a truly integrated and coordinated approach to injury prevention and control. Atlantic Canada’s leadership in this area may also afford more policy traction for this issue at the national level and eventually towards a national strategy for injury prevention and control.

It is expected that the results of this study (see Table 1 for the Summary of Findings) will provide the necessary economic rationale and impetus for policy makers, providers, managers and citizens to make recommendations needed to bring injury prevention to the forefront of policy discussions, as well as to improve existing treatment and rehabilitation approaches. These discussions would encompass the need for program initiatives, communication strategies, engineering strategies, legislative, regulatory and enforcement initiatives, community outreach programs, and injury and age specific education initiatives. An extension of coalitions and networks such as ANIP and its provincial affiliates would enhance coordination efforts. All of these strategies listed above would be necessary to bring about significant reductions in unintentional injuries. In addition, recommendations for improving the measurement and reporting of injury information could be important by-products of this study.

APPROACH TO THE STUDY

Economic burden of illness or cost of illness (COI) studies, are used to characterize the economic dimensions of various health problems/conditions as a key input for planning, budgeting and priority setting. Often, the burden of specific illnesses is compared to the gains or return on investment available from prevention and control programs.

COI studies generally follow two approaches - incidence costing or prevalence costing. The latter captures all costs incurred in a given year. The major limitation with this approach is that the full episode of illness, which may span multiple years or a full lifespan is not captured. The incidence costing method assigns all costs (present and the future stream) to year of injury occurrence (i.e., for all injuries occurring in a given year, the present and future costs associated with the full episode are captured). The stream of future costs is discounted to a present value. Hence, with this approach, the cost of an injury occurrence (i.e. full episode) can be compared to the cost associated with the prevention of that injury. Prevention costs are actually investments. For example, one dollar spent on bicycle helmets averts twenty-nine dollars in injury costs (CDC, 2000).

Cost of illness studies distinguish and measure both direct costs and indirect costs².

Direct costs could be generally considered health care costs. These costs would include goods such as medications, prostheses, and services such as health care provider consultations involved in treatment and rehabilitation.

Indirect costs are societal productivity losses, which account for the individual's inability to perform his or her major activities, which result from the injuries. Indirect costs are generally

captured through measuring foregone/lost income. As well as these economic costs there are certain intangible costs associated with injuries such as pain and suffering, economic dependence and social isolation. While these costs are difficult to quantify in economic terms, they are costs nonetheless and should at least be identified. Too many Atlantic Canadians have their lives and those of their families irrevocably changed forever as a result of injury. This study did not attempt to quantify these costs and, hence, the indirect costs uncovered can be considered conservative.

The vast majority of injury data in Canada relate to inpatient hospital stays. While there are some outpatient data, there are generally no data available for ambulatory care or long-term community care. Hence, the costs associated with a spinal cord injury resulting in permanent paralysis are generally limited to the hospital stay and the lifetime costs are essentially unknown. In order to address this limitation and to capture full episodic costs associated with the various types of unintentional injury, this study employed a unique approach. An Electronic Resource Allocation Tool (ERAT) was developed for Atlantic Canada, and for each Atlantic province, which embodies a classification and costing framework designed around existing provincial injury data and data available from the injury costing literature (Refer to Appendix D for information about ERAT and Appendix E for methodological detail). In essence, the ERAT combines existing data with variables from the literature in order to model full episodic costs for various injuries caused by a range of incidents from falls to motor vehicle crashes to drowning. The ERAT is a flexible tool that can be updated as more or better data become available and according to changes in population, injury incidence and treatment patterns and costs.

² Refer to *The Economic Burden of Unintentional Injury in Canada* (SMARTRISK, 1998) for coverage of related international literature.

Injuries Stories

The current study highlights some of the societal burden of injury in economic terms. Despite the importance of these results, the Atlantic Network for Injury Prevention and SMARTRISK understand that injuries impact the lives of people in many ways not captured by measures of monetary loss, or population statistics. Injuries touch individuals

throughout the Atlantic Region in very personal ways. Throughout this report we will present stories of people who have experienced the burden of injury more directly. These stories are based on real incidents but names and some details have been changed to protect the privacy of those involved.

ATLANTIC CANADA

GENERAL DESCRIPTION

Atlantic Canada is in transition. Factors that were often seen as disadvantages for attracting people to Atlantic Canada are now becoming advantages: our smaller population – more room to grow, more privacy, less traffic; our resource-based and seasonal employment – less heavy industry and smog. We have taken note of our less healthy lifestyle (e.g., smoking rates, obesity rates) and are taking steps to address the associated risk factors. We are taking a population health approach to tackle a number of social and health issues with encouraging results. Health depends on more than just health care. There are a number of determinants of health that have an influence on the health of individuals and communities. The determinants do not act in isolation from each other. It is the complex interaction of these determinants that has an impact on the health of individuals and communities. For example, our health is affected by many factors including housing, the state of our environment, genetics, our income and education level, and our relationships with friends and family. These are all factors that make a difference in how long people live, the quality of their lives and their risk of injury. Injury is the next major issue we need to address in our quest for healthy and safe communities.

We have many individuals and organizations that have been passionately dedicated to

keeping Atlantic Canadians safe. Our police and fire services, our health, transport and recreation sectors and our non-government sector of organizations such as the Canadian Red Cross, St. John Ambulance, Safety Councils, Farm Safety and Workplace Health and Safety organizations – just to name a few – have been and are poised to continue the battle against injury. Our main efforts are and should be focused on the prevention of injury in the first place, but we also need to ensure that, if injured, a person receives timely and comprehensive care to minimize the long-term impact of that injury on his/her life. The first step in developing effective solutions to the injury problem is to provide an accurate description of the problem. One of the challenges for injury surveillance and control in Atlantic Canada is the lack of easily accessible and comprehensive injury data. Comprehensive programs, coordination and collaboration are the other keys to success in reducing injury.

The results of this study highlight a crucial issue. If these injuries are largely preventable, then how much more money and how many more lives could Atlantic Canada save by enhancing existing strategic prevention programs? To demonstrate, the study offers examples of prevention strategies showing the extent to which Atlantic Canada could save money and lives.

Eddie's Story

Eddie was a high school student working part-time at a local lumberyard. It was a typical shift, and his job was to pull out sheets of lumber from a shed. He used a forklift to move a stack of lumber weighing almost 3000 pounds (1360 kg) out of the shed. The load slipped slightly and Eddie

decided to get off the forklift to take a closer look. The lumber suddenly slipped off the forks, hitting Eddie and breaking his back. He spent three months in a rehabilitation facility, and now uses a wheelchair to get around.

RESULTS

TOTAL COSTS

In 1999 preventable injuries cost the people of Atlantic Canada \$1.2 billion or \$489 for every citizen. Falls accounted for \$440 million or 38 per cent of the total amount. Motor vehicle crashes cost \$210 million or roughly 18 per cent of the \$1.2 billion. The remaining 44 per cent of total costs can be attributed to a combination of costs incurred by poisoning, drowning, fires, and a range of other injuries not specified by hospital classification systems (see Fig. 1). On average, each injury generates about \$3672.72

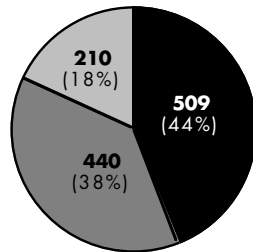
in direct and indirect costs. (See Appendix A for Detailed Tables and Appendix B for a Four-Province comparison.)

DIRECT COSTS

The 315,753 injuries in 1999 accounted for \$672 million in direct health care costs (see Fig. 2). The most costly injuries were those due to falls, totaling almost \$320 million or 48 per cent of total direct costs, and motor vehicle crashes at \$76 million or 11 per cent of direct costs (see Fig. 3).

FIGURE ATL-1

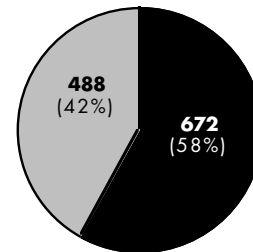
Total Costs by Injury Type (Millions \$)
Atlantic Region, 1999
(total costs = \$1,160)



■ Other ■ Falls ■ Motor Vehicle

FIGURE ATL-2

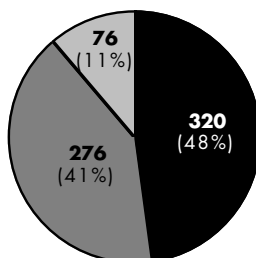
Total Costs of Unintentional Injuries (Millions \$)
Atlantic Region, 1999
(total costs = \$1,160)



■ Direct Costs ■ Indirect Costs

FIGURE ATL-3

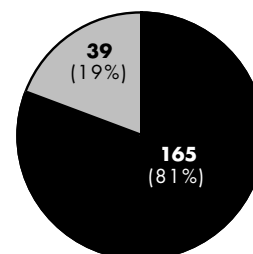
Direct Costs by Injury Type (Millions \$)
Atlantic Region, 1999
(total direct costs = \$672)



■ Falls ■ Other ■ Motor Vehicle

FIGURE ATL-4

Costs for Treating Injured Seniors (Millions \$)
Atlantic Region, 1999
(total costs for treating injured seniors = \$204)



■ Cost of Falls ■ Other Costs

These two types of injury events – falls and motor vehicle crashes - made up about 59 per cent of direct costs. Caring for injured seniors amounted to \$204 million or 30 per cent of the \$672 million in direct costs. Roughly \$165 million (81 per cent) of the direct cost of seniors' injuries is attributable to falls (see Fig. 4) where approximately 70 per cent of the costs (almost \$115 million) are generated by falls among older women (see Fig. 5). Treating children (0-9) and youth (10-19) for falls cost almost \$56 million or 18 per cent of the direct

costs for falls, with males representing 23 per cent more cases than females (see Fig. 6 and 9).

Although only 5 per cent of patients injured ended up in hospital, the cost of hospitalization generated 15 per cent or nearly \$98 million of the \$672 million spent on direct costs. However, 95 per cent of the injuries assessed were not hospitalized, accounting for 85 per cent or an estimated \$574 million of the total direct costs.

FIGURE ATL-5

Total Costs of Falls by Gender and Age Group (Millions \$)
Atlantic Region, 1999
(total costs of falls = \$440)

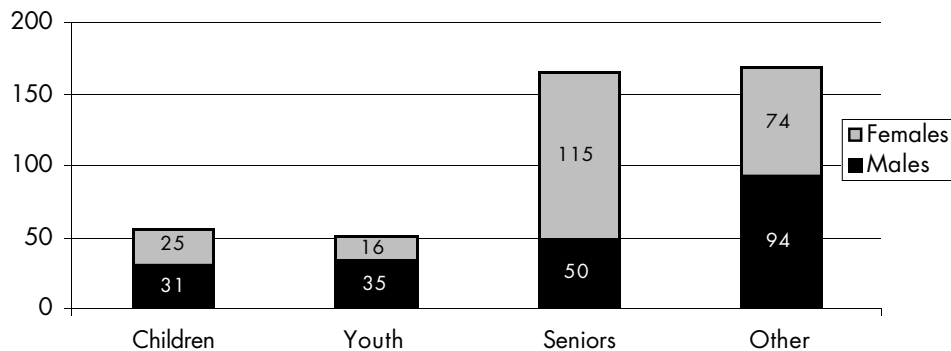
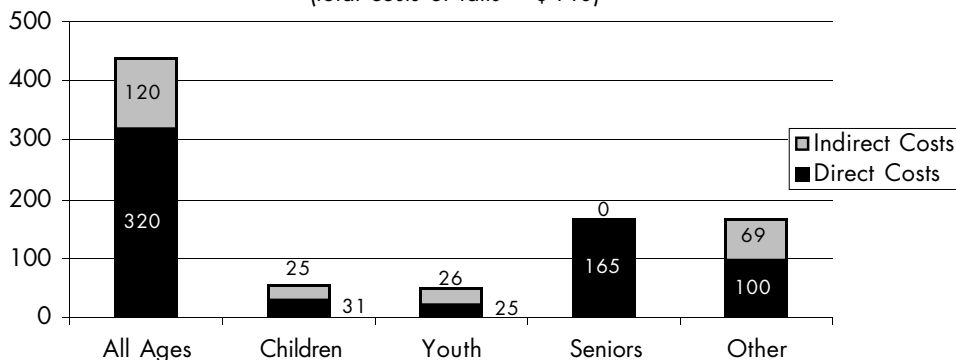


FIGURE ATL-6

Direct and Indirect Costs of Falls by Age Group (Millions \$)
Atlantic Region, 1999
(total costs of falls = \$440)



INDIRECT COSTS

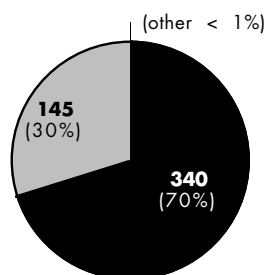
The 7354 injuries that led to permanent disability or death amount to \$488 million in indirect costs (see Fig. 2). Permanent disability caused the greatest losses in productivity, amounting to almost \$340 million or 70 per cent of indirect costs. Injuries causing death accounted for about \$145 million of the \$488 million total (see Fig. 7).

The two most significant types of injury event causing permanent disability were falls and motor vehicle crashes generating over \$163 million in indirect costs. Falls accounted for \$113 million (33 per cent). Motor vehicle crashes cost \$50 million (15 per cent) of the total disability-related indirect costs (see Fig. 8).

FIGURE ATL-7

Sources of Indirect Costs (Millions \$)

Atlantic Region, 1999
(total indirect costs = \$488)

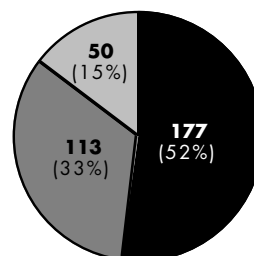


■ Perm. Disab. ■ Inj. Causing Death □ Other

FIGURE ATL-8

Indirect Disability Costs by Injury Type (Millions \$)

Atlantic Region, 1999
(total indirect disability costs = \$340)

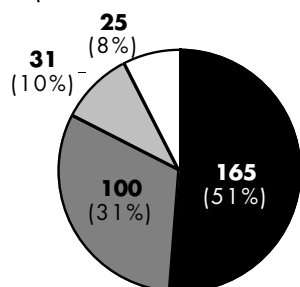


■ Other ■ Falls □ Motor Vehicle

FIGURE ATL-9

Direct Costs of Falls by Age Group (Millions \$)

Atlantic Region, 1999
(direct costs of falls = \$320)

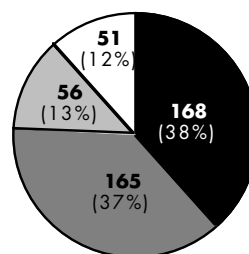


■ Seniors ■ Other ■ Children □ Youth

FIGURE ATL-10

Total Costs of Falls by Age Group (Millions \$)

Atlantic Region, 1999
(total costs of falls = \$440)



■ Other ■ Seniors ■ Children □ Youth

NEW BRUNSWICK

GENERAL DESCRIPTION

New Brunswick, Canada's only officially bilingual province, faces many challenges when dealing with injury prevention. The majority of NB's 729,498 residents live on the perimeter of the province that covers 73,440 square km. Over 50% of the population resides in urban sites. The large areas of remote rural access create unique challenges for a collaborative approach in injury control.

MAIN INDUSTRY

Approximately 85% of the land base is productive forest that allows for a large forestry industry as well as limitless recreational opportunities for the general public. Fisheries, aquaculture, mining and manufacturing are the other main industries.

INJURY PREVENTION INITIATIVES

The NB government has recognized that injury is a health challenge and is striving to address injury issues on a number of fronts. The Healthy Learners Program has allocated public health nurses to each school district in the province. They are using a comprehensive school health approach to address health promotion as well as disease and injury prevention priorities with students, families and communities. In addition, the New Brunswick Health Care Report Card 2003

recognizes that "programs to improve social and economic conditions, to promote safe driving, to reduce recreational vehicle crashes and to enhance health and safety will all contribute to improving population health status". The Department of Public Safety recently announced legislative changes to the ATV Act as part of government's response to the All-Terrain Vehicle Task Force Report. Developing strategies to prevent injury and promote healthy living is a key component of the government's vision for renewing health care in New Brunswick.

EMERGENCY HEALTH SERVICES

Large areas of remote rural access, multiple pre-hospital agencies, and varied health services provide a challenge for trauma care. Although emergency health services are not centralized, the province does have an accredited Tertiary Trauma Centre located at the Saint John Regional Hospital in Saint John. The Trauma Program has developed many community partnerships to enhance injury prevention programs throughout the region and province. These partnerships led to the recent establishment of the NB Injury Prevention Coalition, however challenges remain in initiating and maintaining linkages with other regions of the province on injury prevention issues.

Alex's Story

Several years ago nineteen-year-old Alex was seriously injured by a car driven by an impaired driver. It was a devastating experience for the whole family. Alex was permanently injured and his parents were overcome with shock, guilt as well as emotional and financial stress. They

watched their son deal with things that no child should ever have to deal with. There was grief and a sense of dreams being shattered. Like everyone, they never imagined having to deal with a serious injury, and never imagined how much it would impact their lives.

RESULTS

TOTAL COSTS

In 1999 preventable injuries cost the people of New Brunswick \$502 million or \$664 for every citizen. Falls accounted for \$172 million or 34 per cent of the total amount. Motor vehicle crashes cost \$91 million or roughly 18 per cent of the \$502 million. The remaining 48 per cent of total costs can be attributed to a combination of costs incurred by poisoning, drowning, fires, and a range of other injuries not specified by hospital classification systems (see Fig. NB-1).

On average, each injury generates about \$3,457.38 in direct and indirect costs.

DIRECT COSTS

The 145,088 injuries in 1999 accounted for \$278 million in direct health care costs (see Fig. NB-2). The most costly injuries were those due to falls, totaling almost \$121 million or 44 per cent of total direct costs, and motor vehicle crashes at \$31 million or 11 per cent of direct costs (see Fig. NB-3).

FIGURE NB-1

Total Costs by Injury Type (Millions \$)
New Brunswick, 1999
(total costs = \$502)

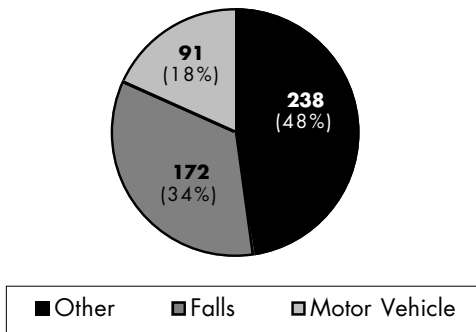


FIGURE NB-2

Total Costs of Unintentional Injuries (Millions \$)
New Brunswick, 1999
(total costs = \$502)

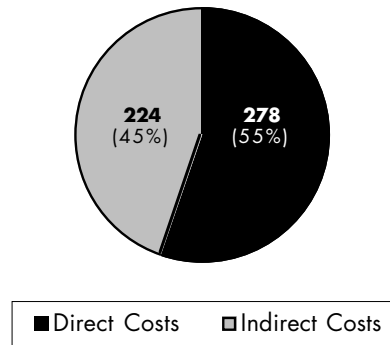


FIGURE NB-3

Direct Costs by Injury Type (Millions \$)
New Brunswick, 1999
(total direct costs = \$278)

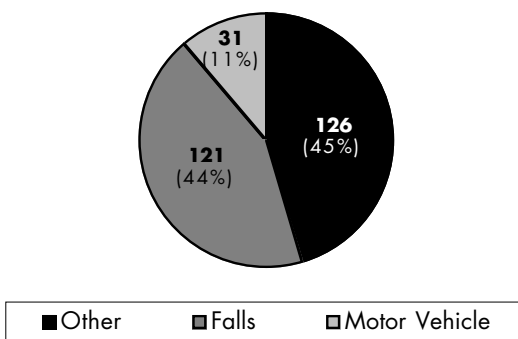
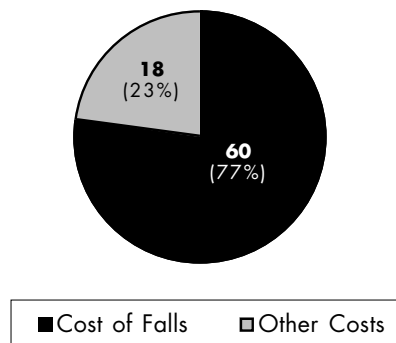


FIGURE NB-4

Costs for Treating Injured Seniors (Millions \$)
New Brunswick, 1999
(total costs for treating injured seniors = \$77)



These two types of injury events – falls and motor vehicle crashes - made up about 55 per cent of direct costs. Caring for injured seniors amounted to \$77 million or 34 per cent of the \$224 million in direct costs. Roughly \$60 million (77 per cent) of the direct cost of seniors' injuries is attributable to falls (see Fig. NB-4) where approximately 72 per cent of the costs (almost \$42 million) are generated by falls among older women (see Fig. NB-5). Treating children and youth for falls cost almost \$23 million or 19 per cent of the direct costs for

falls, with males representing 34 per cent more cases than females (see Fig. NB-6 and NB-9).

Although only 5 per cent of patients injured ended up in hospital, the cost of hospitalization generated 13 per cent or nearly \$37 million of the \$278 million spent on direct costs. However, 95 per cent of the injuries assessed were not hospitalized, accounting for 87 per cent or an estimated \$241 million of the total direct costs.

FIGURE NB-5

Total Costs of Falls by Gender and Age Group (Millions \$)
 New Brunswick, 1999
 (total costs of falls = \$172)

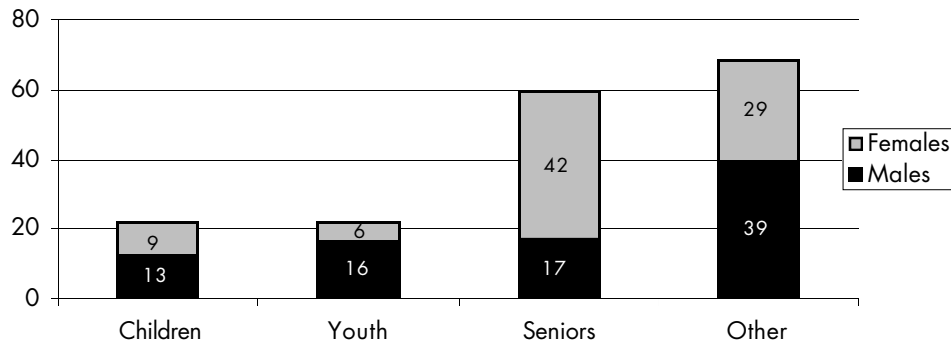
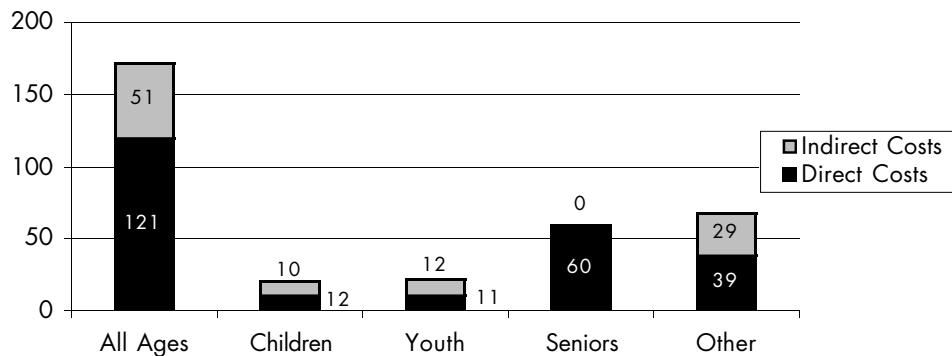


FIGURE NB-6

Direct and Indirect Costs of Falls by Age Group (Millions \$)
 New Brunswick, 1999
 (total costs of falls = \$172)



INDIRECT COSTS

The 3,160 injuries that led to permanent disability or death amount to \$224 million in indirect costs (see Fig. NB-2). Permanent disability caused the greatest losses in productivity, amounting to almost \$161 million or 72 per cent of indirect costs. Injuries causing death accounted for about \$61 million of the \$224 million total (see Fig. NB-7).

The two most significant types of injury events causing permanent disability were falls and motor vehicle crashes generating over \$70 million in indirect costs. Falls accounted for \$49 million (30 per cent). Motor vehicle crashes cost \$21 million (13 per cent) of the total disability-related indirect costs (see Fig. NB-8).

FIGURE NB-7

Sources of Indirect Costs (Millions \$)
New Brunswick, 1999
(total indirect costs = \$224)

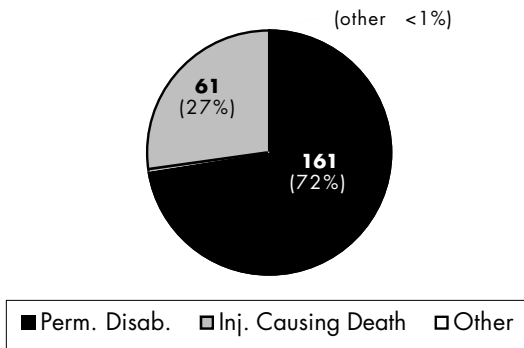


FIGURE NB-8

Indirect Disability Costs by Injury Type (Millions \$)
New Brunswick, 1999
(total indirect disability costs = \$161)

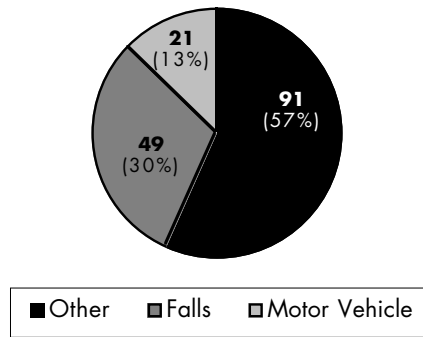


FIGURE NB-9

Direct Costs of Falls by Age Group (Millions \$)
Newfoundland and Labrador, 1999
(direct costs of falls = \$57)

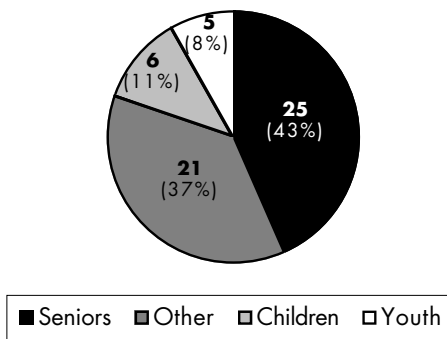
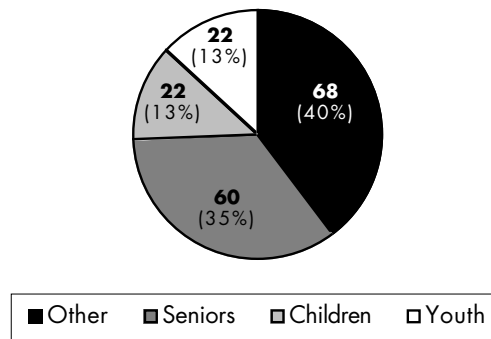


FIGURE NB-10

Total Costs of Falls by Age Group (Millions \$)
New Brunswick, 1999
(total costs of falls = \$172)



NEWFOUNDLAND AND LABRADOR

GENERAL DESCRIPTION

Newfoundland and Labrador (NL), faces a number of key challenges in the area of injury prevention. The landmass of the province is more than three times the total area of the Maritime Provinces, yet the population is only 531,145. The population size and structure in the province is undergoing significant change. The population is declining, showing the largest percentage decline of any province in Canada. Additionally, urban areas are becoming more populated while many rural regions are seeing population decreases. The average age of the population is increasing, and more young people are leaving.

MAIN INDUSTRY

Newfoundland and Labrador's major industries include oil, fishing, forestry and mining.

INJURY PREVENTION INITIATIVES

Several injury prevention initiatives are taking place within the province. The NL provincial government has formulated a Strategic Health Plan, which sets out major long-term goals and identifies the objectives, actions, and targets that will be pursued over the next five years. An injury prevention initiative focused on children, youth and seniors has been identified

within this plan. On April 1st, 2003 NL became the first province in Canada to ban the use of hand-held cell phones while driving. In 2002 the Workplace Health, Safety & Compensation Commission launched a workplace accident prevention strategy report entitled Promoting Safe and Healthy Workplaces and early indications suggest that a change in mindset is occurring and injury rates are decreasing. There is an active Injury Prevention Coalition in NL that welcomes the opportunity to work together with government to address these priorities.

EMERGENCY HEALTH SERVICES

As the population of the province is dispersed, quality and access issues in this province exist in the areas of pre-hospital emergency care through ambulance services. The provincial ambulance service incorporates both ground and air ambulance services. The provincial ground ambulance program is oriented towards the provision of pre-hospital care at both basic and intermediate levels and is facilitated by a number of ambulance services operating from 82 locations throughout the province. Air ambulance aircraft respond to about 880 medivac requests annually. The trauma centre for the province is located at the Health Science Center in St. John's.

Eleanor's Story

Eighty-five-year-old Eleanor was holding a door open for a friend when she lost her balance and fell flat on her back. Although she was lucky – there were no broken bones – Eleanor found it more difficult to do her normal chores, like making the bed. She also found it more difficult to

stay active and she had some pain. Increasingly less stable on her feet, Eleanor fell again several weeks later and this time it was serious – two broken vertebrae. She is afraid that next time she will break her hip and will not be able to live on her own anymore.

RESULTS

TOTAL COSTS

In 1999 preventable injuries cost the people of Newfoundland and Labrador \$213 million or \$394 for every citizen. Falls accounted for \$80 million or 38 per cent of the total amount. Motor vehicle crashes cost \$33 million or roughly 15 per cent of the \$213 million. The remaining 47 per cent of total costs can be attributed to a combination of costs incurred by poisoning, drowning, fires, and a range of other injuries not specified by hospital

classification systems (see Fig. NL-1). On average, each injury generates about \$3,546.91 in direct and indirect costs.

DIRECT COSTS

The 60,179 injuries in 1999 accounted for \$124 million in direct health care costs (see Fig. NL-2). The most costly injuries were those due to falls, totaling almost \$57 million or 46 per cent of total direct costs, and motor vehicle crashes at \$15 million or 12 per cent of direct costs (see Fig. NL-3).

FIGURE NL-1

Total Costs by Injury Type (Millions \$)
Newfoundland and Labrador, 1999
(total costs = \$213)

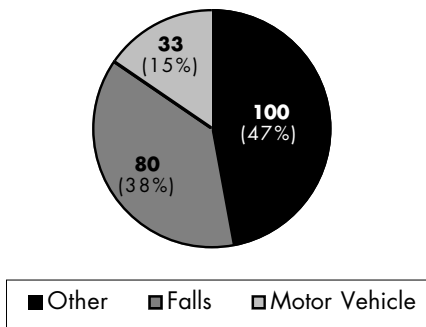


FIGURE NL-2

Total Costs of Unintentional Injuries (Millions \$)
Newfoundland and Labrador, 1999
(total costs = \$213)

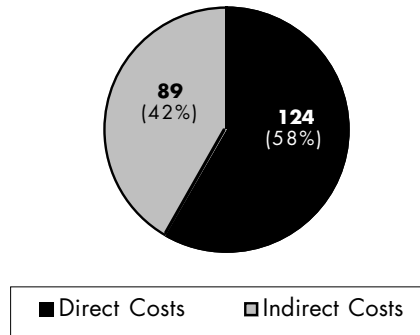


FIGURE NL-3

Direct Costs by Injury Type (Millions \$)
Newfoundland and Labrador, 1999
(total direct costs = \$124)

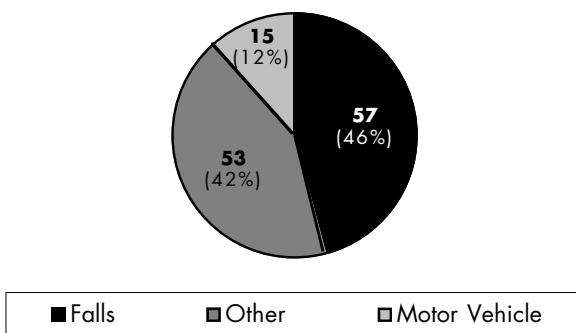
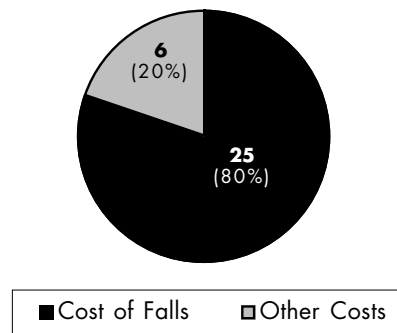


FIGURE NL-4

Costs for Treating Injured Seniors (Millions \$)
Newfoundland and Labrador, 1999
(total costs for treating injured seniors = \$31)



These two types of injury events – falls and motor vehicle crashes - made up about 58 per cent of direct costs. Caring for injured seniors amounted to \$31 million or 25 per cent of the \$124 million in direct costs. Roughly \$25 million (80 per cent) of the direct cost of seniors' injuries is attributable to falls (see Fig. NL-4) where approximately 68 per cent of the costs (almost \$17 million) are generated by falls among older women (see Fig. NL-5). Treating children and youth for falls cost almost \$11 million or 19 per cent of the direct costs for

falls, with males representing 13 per cent more cases than females (see Fig. NL-6 and NL-9).

Although only 6 per cent of patients injured ended up in hospital, the cost of hospitalization generated 13 per cent or nearly \$17 million of the \$124 million spent on direct costs. However, 94 per cent of the injuries assessed were not hospitalized, accounting for 87 per cent or an estimated \$107 million of the total direct costs.

FIGURE NL-5

Total Costs of Falls by Gender and Age Group (Millions \$)
 Newfoundland and Labrador, 1999
 (total costs of falls = \$80)

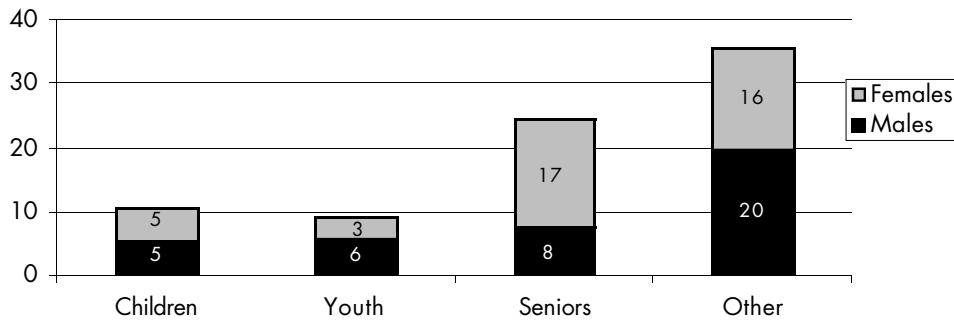
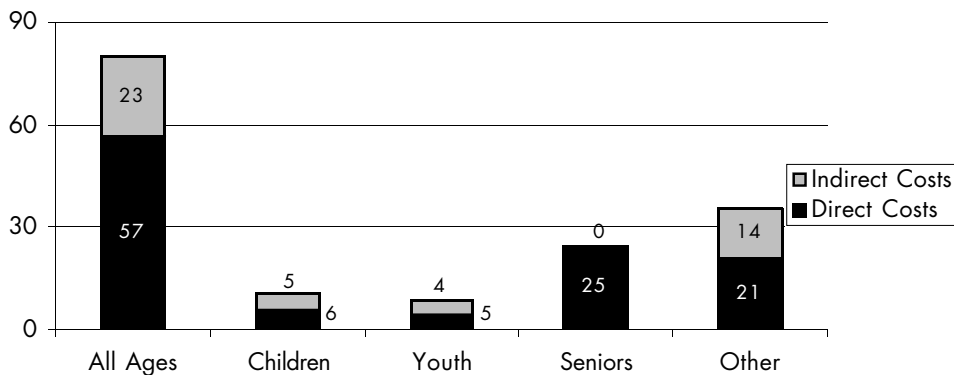


FIGURE NL-6

Direct and Indirect Costs of Falls by Age Group (Millions \$)
 Newfoundland and Labrador, 1999
 (total costs of falls = \$80)



INDIRECT COSTS

The 1,396 injuries that led to permanent disability or death amount to \$89 million in indirect costs (see Fig. NL-2). Permanent disability caused the greatest losses in productivity, amounting to almost \$64 million or 72 per cent of indirect costs. Injuries causing death accounted for about \$24 million of the \$89 million total (see Fig. NL-7).

The two most significant types of injury events causing permanent disability were falls and motor vehicle crashes generating over \$31 million in indirect costs. Falls accounted for \$22 million (34 per cent). Motor vehicle crashes cost \$9 million (13 per cent) of the total disability-related indirect costs (see Fig. NL-8).

FIGURE NL-7

Sources of Indirect Costs (Millions \$)
Newfoundland and Labrador, 1999
(total indirect costs = \$89)

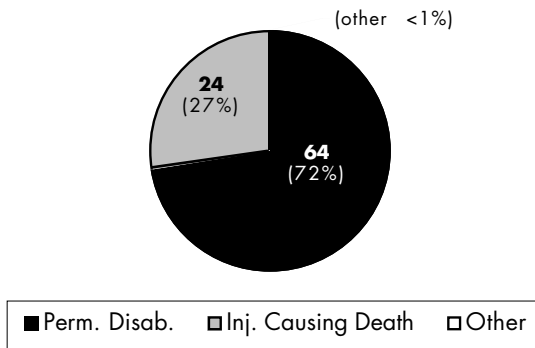


FIGURE NL-8

Indirect Disability Costs by Injury Type (Millions \$)
Newfoundland and Labrador, 1999
(total indirect disability costs = \$64)

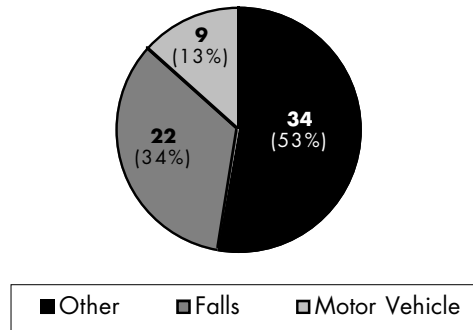


FIGURE NL-9

Direct Costs of Falls by Age Group (Millions \$)
Newfoundland and Labrador, 1999
(direct costs of falls = \$57)

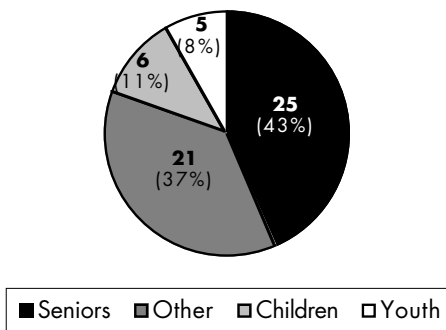
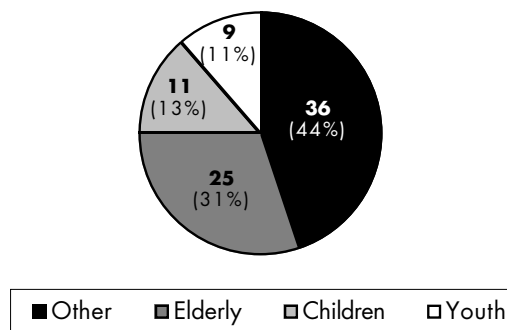


FIGURE NL-10

Total Costs of Falls by Age Group (Millions \$)
Newfoundland and Labrador, 1999
(total costs of falls = \$80)



NOVA SCOTIA

GENERAL DESCRIPTION

Nova Scotia has a population of 944,456 people, comprising about 3% of the total population of Canada. Covering an area of approximately 53,000 km², Nova Scotia consists of a mainland portion, connected to New Brunswick and the remainder of Canada by a thin piece of land, and Cape Breton Island, which is joined to the mainland of Nova Scotia by the Canso Causeway. Nova Scotia is appropriately known as Canada's Ocean Playground. Its coastline has many bays and inlets, stretching for more than 7,400 km and no part of the province is ever any more than 56 km from the ocean.

MAIN INDUSTRY

Most of Nova Scotia is covered with forests and lakes, and its primary industries include the fishery, tourism, forestry, agriculture, and offshore oil and gas.

INJURY PREVENTION INITIATIVES

Many organizations are working on injury prevention issues and programs in the province. For example, the Nova Scotia Safety Council has recently introduced the Youth Safety Portal, a new web-based injury prevention initiative aimed at young Nova Scotians who are entering the workforce. Child

Safety Link (Maritime-wide program), located at the IWK Health Centre, has launched an injury awareness campaign on television through their partnership with ATV, the Maritime affiliate of CTV. Emergency Health Services has helped facilitate injury prevention partnerships through the Nova Scotia Trauma Advisory Council. Through the efforts of ANIP and its NS chapter that is under development, many organizations are starting to partner and work together on projects. The recent release of data reports on the incidence of injuries to children and to adults has also helped to create momentum in the field.

EMERGENCY HEALTH SERVICES

Nova Scotia has recently been identified as having the top emergency health services system in Canada and one of the top five in North America. This represents one of the strengths of Nova Scotia's health care system. In recognition of the injury epidemic and the need for a well-designed systematic response, the Nova Scotia Trauma Program was created in 1997, as a program of the Department of Health, Emergency Health Services Division. The mandate of the Nova Scotia Trauma Program is to facilitate the provision of optimal trauma care through leadership in injury prevention and control, education, research, and trauma system development.

Eric's Story

Two-year-old Eric woke up early one morning and climbed out of his crib and headed to the kitchen while the family slept. He managed to climb up on the kitchen counter and then on the stove where he started playing with the burner controls. Wearing one-piece flammable pajamas, and his right foot now on a hot burner, Eric's clothing caught fire. Eric's mother heard screams and

raced into the kitchen and doused the flames, but not before her son was left with third degree burns to almost 50 per cent of his body. Eric spent a whole year in the hospital recovering. Since the injury, more than two decades, there are now strict rules for infant sleepwear to make sure that that pajamas like the pair Eric was wearing will not catch fire.

RESULTS

TOTAL COSTS

In 1999 preventable injuries cost the people of Nova Scotia \$372 million or \$396 for every citizen. Falls accounted for \$160 million or 43 per cent of the total amount. Motor vehicle crashes cost \$74 million or roughly 20 per cent of the \$372 million. The remaining 37 per cent of total costs can be attributed to a combination of costs incurred by poisoning, drowning, fires, and a range of other injuries not specified by hospital classification systems (see Fig. NS-1).

On average, each injury generates about \$4,146.46 in direct and indirect costs.

DIRECT COSTS

The 89,793 injuries in 1999 accounted for \$227 million in direct health care costs (see Fig. NS-2). The most costly injuries were those due to falls, totaling almost \$123 million or 54 per cent of total direct costs, and motor vehicle crashes at \$25 million or 11 per cent of direct costs (see Fig. NS-3).

FIGURE NS-1

Total Costs by Injury Type (Millions \$)
Nova Scotia, 1999
(total costs = \$372)

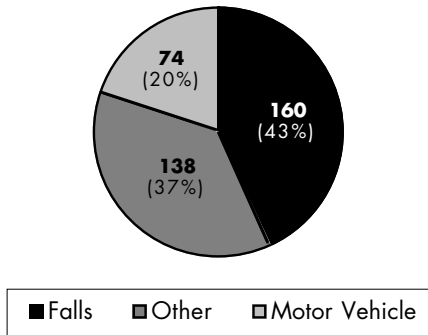


FIGURE NS-2

Total Costs of Unintentional Injuries (Millions \$)
Nova Scotia, 1999
(total costs = \$372)

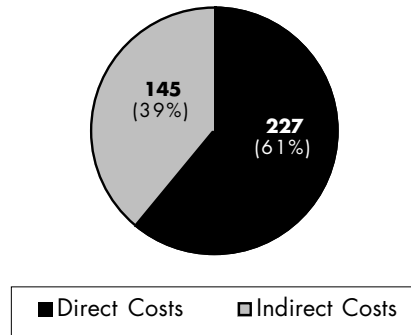


FIGURE NS-3

Direct Costs by Injury Type (Millions \$)
Nova Scotia, 1999
(total direct costs = \$227)

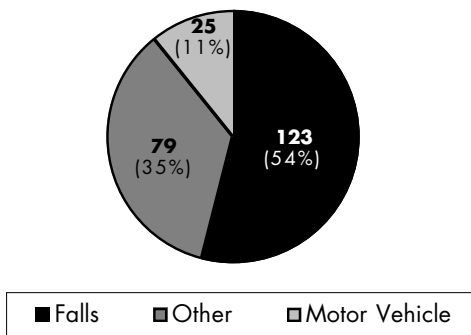
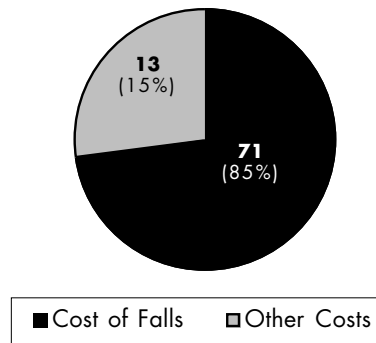


FIGURE NS-4

Costs for treating Injured Seniors (Millions \$)
Nova Scotia, 1999
(total costs for treating injured seniors = \$84)



These two types of injury events – falls and motor vehicle crashes - made up about 65 per cent of direct costs. Caring for injured seniors amounted to \$84 million or 37 per cent of the \$227 million in direct costs. Roughly \$71 million (85 per cent) of the direct cost of seniors' injuries is attributable to falls (see Fig. NS-4) where approximately 69 per cent of the costs (almost \$49 million) are generated by falls among older women (see Fig. NS-5). Treating children and youth for falls cost almost \$19 million or 15 per cent of the direct costs for

falls, with males representing 20 per cent more cases than females (see Fig. NS-6 and NS-9).

Although only 6 per cent of patients injured ended up in hospital, the cost of hospitalization generated 17 per cent or nearly \$39 million of the \$227 million spent on direct costs. However, 94 per cent of the injuries assessed were not hospitalized, accounting for 83 per cent or an estimated \$188 million of the total direct costs.

FIGURE NS-5

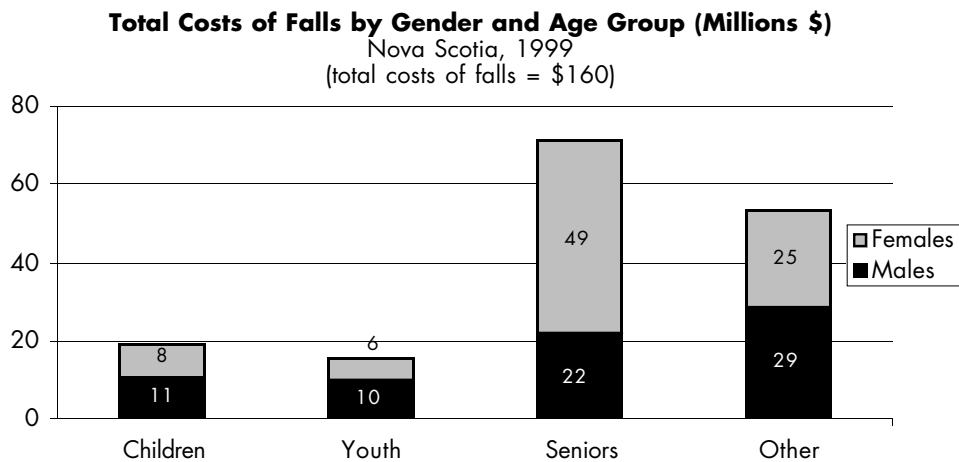
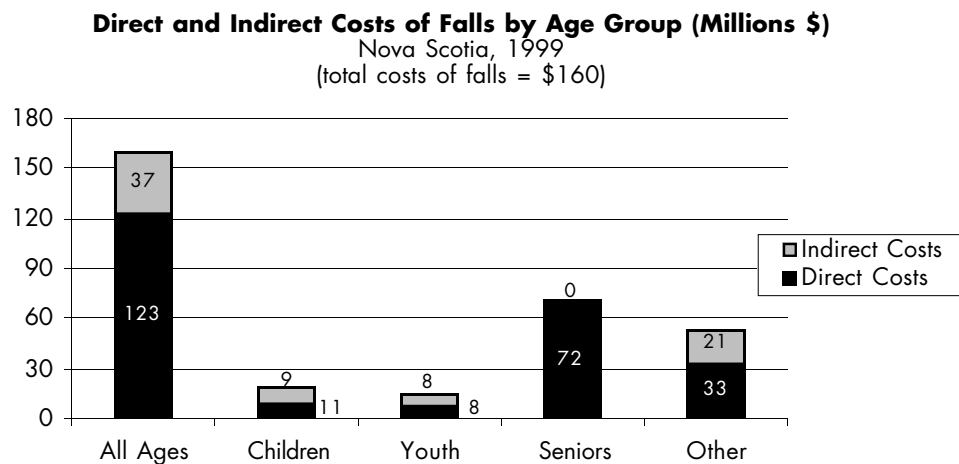


FIGURE NS-6



INDIRECT COSTS

The 2,320 injuries that led to permanent disability or death amount to \$145 million in indirect costs (see Fig. NS-2). Permanent disability caused the greatest losses in productivity, amounting to almost \$94 million or 65 per cent of indirect costs. Injuries causing death accounted for about \$50 million of the \$145 million total (see Fig. NS-7).

The two most significant types of injury events causing permanent disability were falls and motor vehicle crashes generating over \$52 million in indirect costs. Falls accounted for \$35 million (37 per cent). Motor vehicle crashes cost \$17 million (18 per cent) of the total disability-related indirect costs (see Fig. NS-8).

FIGURE NS-7

Sources of Indirect Costs (Millions \$)
Nova Scotia, 1999
(total indirect costs = \$145)

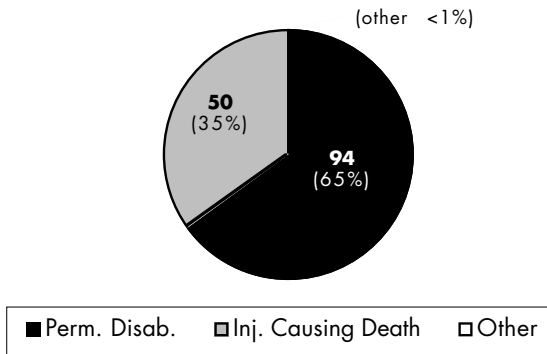


FIGURE NS-8

Indirect Disability Costs by Injury Type (Millions \$)
Nova Scotia, 1999
(total indirect disability costs = \$94)

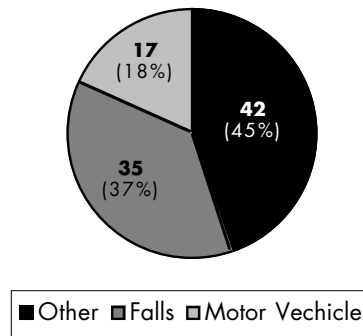


FIGURE NS-9

Direct Costs of Falls by Age Group (Millions \$)
Nova Scotia, 1999
(direct costs of falls = \$123)

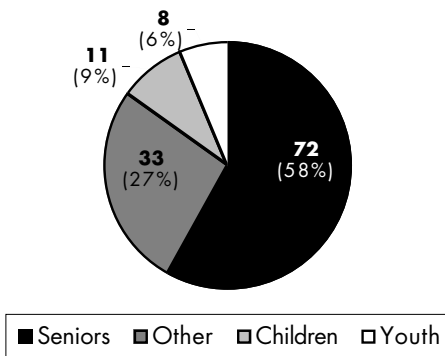
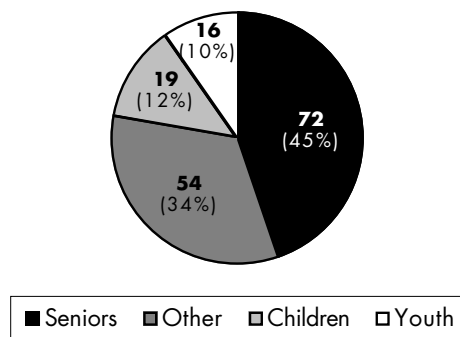


FIGURE NS-10

Total Costs of Falls by Age Group (Millions \$)
Nova Scotia, 1999
(total costs of falls = \$160)



PRINCE EDWARD ISLAND

GENERAL DESCRIPTION

Prince Edward Island's (PEI) population of approximately 140,412 and its small island geography present unique challenges and opportunities for injury prevention and control. Although a rural province, the population is increasingly clustered around the major centers of Charlottetown and Summerside. The population is also aging.

MAIN INDUSTRY

The province's major industries include farming, tourism and fishing. Potatoes represent more than half of the acres devoted to agriculture and contribute the major source of farm income. Tourism is the second largest and fastest growing industry as visitation has increased steadily following the opening of Confederation Bridge. In 2001, highly skilled occupations accounted for only 12% of the labour force.

INJURY PREVENTION INITIATIVES

Injury prevention is one of the key areas in PEI's Healthy Child Development Strategy. It is not, however, currently addressed in health strategies for other age groups. Legislative approaches, particularly in the area of

transportation related injuries, have been adopted to try to reduce the number and severity of these injuries. Groups working in the area of injury prevention have come together to begin to address these issues collectively under the banner of the PEI Network for Injury Prevention and other issue specific coalitions (e.g. Car Seats).

EMERGENCY HEALTH SERVICES

PEI has a province-wide 911 program in place to respond to emergencies. Each home and business on the Island has a civic address consisting of a street number, street name, civic community and county. This address system is used by the privately owned and operated ambulance and emergency services to facilitate the timely location of the injured.

Unfortunately, responding to severe trauma remains a concern as there is no accredited trauma center on PEI. Trauma patients are transported by air or ground ambulance from the two major hospitals in Charlottetown and Summerside to centres in New Brunswick or Nova Scotia. Because of the distances involved, lengthy travel time has the potential to hinder the long-term outcomes of severely injured patients.

Sam's Story

It was a late summer day and seven-year-old Sam was playing with friends on a farm front yard, not far from where grain was being harvested. A farmer and truck driver were getting ready to unload barley, unaware that young Sam had moved closer to investigate the operation. Losing

his balance, Sam pushed through a safety screen and into the auger. He lost his arm above the elbow and was taken to hospital where he was stabilized. He has since recovered and is now an injury prevention spokesperson.

RESULTS

TOTAL COSTS

In 1999 preventable injuries cost the people of Prince Edward Island \$74 million or \$535 for every citizen. Falls accounted for \$28 million or 38 per cent of the total amount. Motor vehicle crashes cost \$15 million or roughly 20 per cent of the \$74 million. The remaining 42 per cent of total costs can be attributed to a combination of costs incurred by poisoning, drowning, fires, and a range of other injuries not specified by hospital classification systems (see Fig. PEI-1).

On average, each injury generates about \$3,567.41 in direct and indirect costs.

DIRECT COSTS

The 20,694 injuries in 1999 accounted for \$42 million in direct health care costs (see Fig. PEI-2). The most costly injuries were those due to falls, totaling almost \$20 million or 47 per cent of total direct costs, and motor vehicle crashes at \$5 million or 13 per cent of direct costs (see Fig. PEI-3).

FIGURE PEI-1

Total Costs by Injury Type (Millions \$)

Prince Edward Island, 1999
(total costs = \$74)

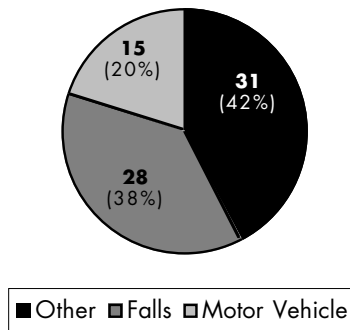


FIGURE PEI-2

Total Costs of Unintentional Injuries (Millions \$)

Prince Edward Island, 1999
(total costs = \$74)

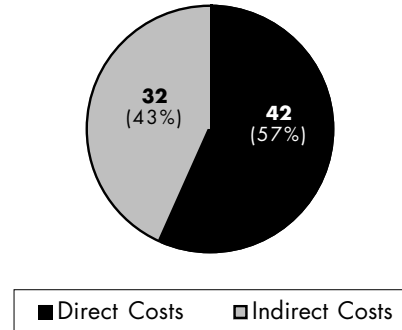


FIGURE PEI-3

Direct Costs by Injury Type (Millions \$)

Prince Edward Island, 1999
(total direct costs = \$42)

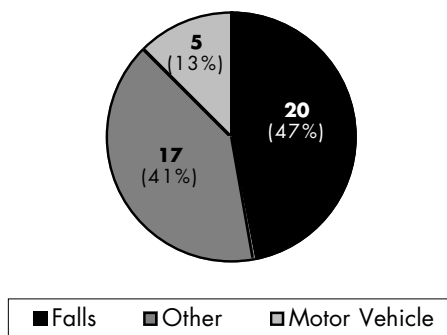
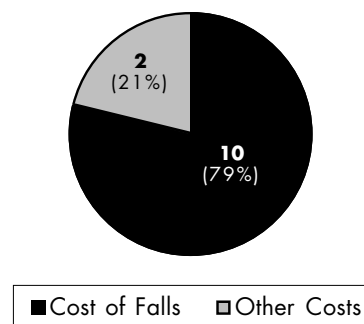


FIGURE PEI-4

Costs for Treating Injured Seniors (Millions \$)

Prince Edward Island, 1999
(total costs for treating injured seniors = \$12)



These two types of injury events – falls and motor vehicle crashes - made up about 60 per cent of direct costs. Caring for injured seniors amounted to \$12 million or 17 per cent of the \$42 million in direct costs. Roughly \$10 million (79 per cent) of the direct cost of seniors' injuries is attributable to falls (see Fig. PEI-4) where approximately 77 per cent of the costs (almost \$7 million) are generated by falls among older women (see Fig. PEI-5). Treating children and youth for falls cost almost \$4 million or 19 per cent of the direct costs for falls, with males representing 15 per cent more cases than females (see Fig. PEI-6 and PEI-9).

Although only 6 per cent of patients injured ended up in hospital, the cost of hospitalization generated 14 per cent or nearly \$6 million of the \$42 million spent on direct costs. However, 94 per cent of the injuries assessed were not hospitalized, accounting for 86 per cent or an estimated \$36 million of the total direct costs.

INDIRECT COSTS

The 478 injuries that led to permanent disability or death amount to \$32 million in indirect costs (see Fig. PEI-2). Permanent disability caused the greatest losses in

FIGURE PEI-5

Total Costs of Falls by Gender and Age Group (Millions \$)

Prince Edward Island, 1999
(total costs of falls = \$28)

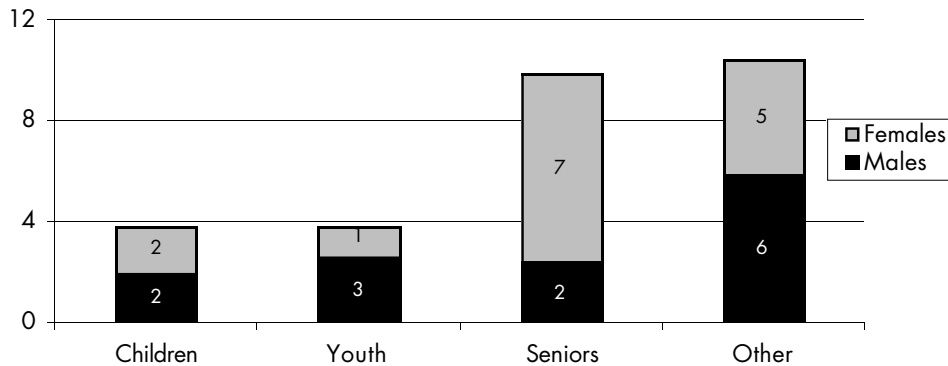
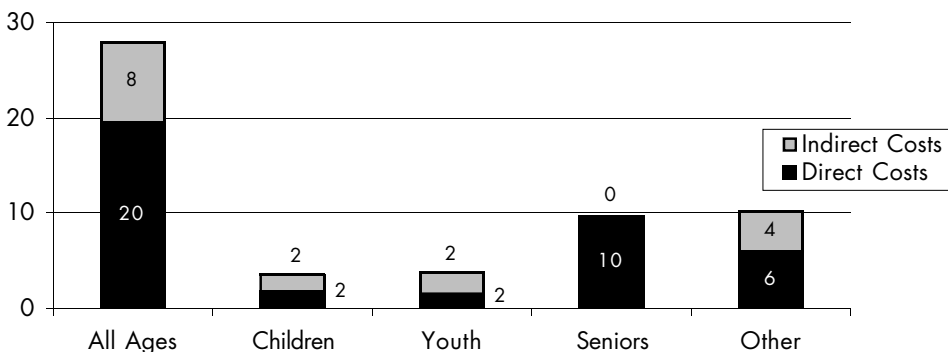


FIGURE PEI-6

Direct and Indirect Costs of Falls by Age Group (Millions \$)

Prince Edward Island, 1999
(total costs of falls = \$28)



productivity, amounting to almost \$22 million or 70 per cent of indirect costs. Injuries causing death accounted for about \$9 million of the \$32 million total (see Fig. PEI-7).

The two most significant types of injury events causing permanent disability were falls and

motor vehicle crashes generating over \$12 million in indirect costs. Falls accounted for \$8 million (35 per cent). Motor vehicle crashes cost \$4 million (17 per cent) of the total disability-related indirect costs (see Fig. PEI-8).

FIGURE PEI-7

Sources of Indirect Costs (Millions \$)
 Prince Edward Island, 1999
 (total indirect costs = \$32)

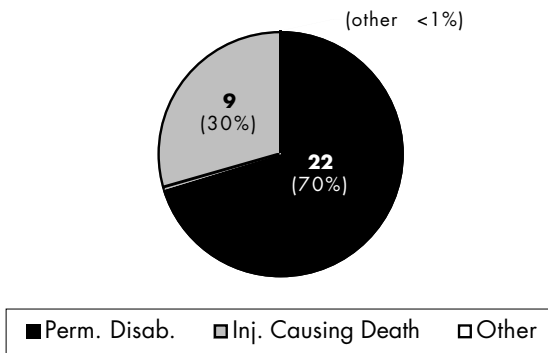


FIGURE PEI-8

Indirect Disability Costs by Injury Type (Millions \$)
 Prince Edward Island, 1999
 (total indirect disability costs = \$22)

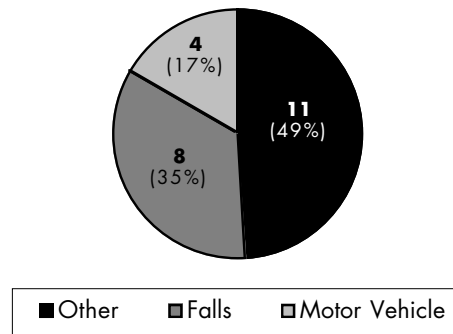


FIGURE PEI-9

Direct Costs of Falls by Age Group (Millions \$)
 Prince Edward Island, 1999
 (direct costs of falls = \$20)

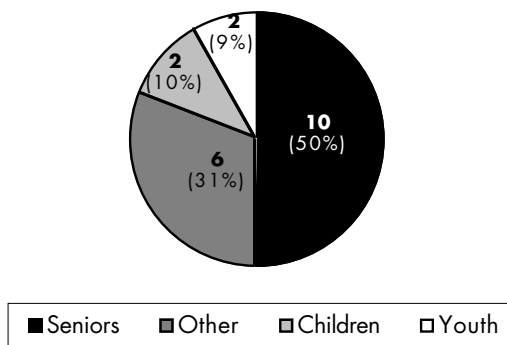
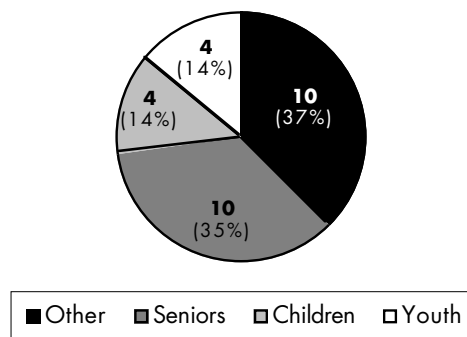


FIGURE PEI-10

Total Costs of Falls by Age Group (Millions \$)
 Prince Edward Island, 1999
 (total costs of falls = \$28)



DISCUSSION

THE COST OF A SILENT EPIDEMIC

The staggering costs determined by this study prove that Atlantic Canada is suffering from an injury epidemic that reflects a pan-Canadian public health challenge. The people of Atlantic Canada do not need to spend over a billion dollars each year on over 300,000 injuries that could have been largely prevented in the first place.

INJURY PREVENTION CUTS COSTS

There is a stark contrast between the cost of preventing injuries and the cost of treating injuries. Prevention always costs less³:

- \$1 spent on smoke alarms saves \$69
- \$1 spent on bicycle helmets saves \$29
- \$1 spent on child safety seats saves \$32
- \$1 spent on road safety improvements saves \$3
- \$1 spent on prevention counseling by pediatricians saves \$10
- \$1 spent on poison control services saves \$7

The provinces of Atlantic Canada and the broader injury prevention community have invested in programs and in strategies to tackle the injury problem. How much money could enhancement of current injury prevention programs save the people of Atlantic Canada? The following scenarios illustrate how targeting the most costly causes of injury combined with the most vulnerable population groups can generate real savings. Combined, these conservative injury reduction targets

could produce about \$100 million in savings annually. More savings could be available through the development of a comprehensive injury prevention and control strategy. For example, an across the board injury reduction target of 30% could produce almost \$350 million in savings.

FALLS AMONG SENIORS

This study has shown that \$165 million of the \$320 million in direct costs spent on falls was devoted to treating falls among seniors (see Fig. ATL-9). It is estimated that about 40 per cent of falls leading to hospitalization are the result of hip fractures, and that the number of hip fractures in Canada will increase dramatically from 23,375 in 1993 to over 88,000 cases by the year 2041 as the Canadian population ages (Papadimitropoulos et al., 1997). This statistic becomes even more alarming when one considers that by 2036, seniors will make up nearly one third of the population of Atlantic Canada (Lilley and Campbell, 1999).

These are falls that can be prevented by recognizing risk factors such as a history of falls, impairment related to cognition, balance and gait, low body mass index, the misuse of medications and hazards in the home. By targeting these risk factors through prevention programs, setting a hospitalization reduction target of 20 per cent, the current analysis suggests this could lead to over 1,000 fewer hospital stays and 250 fewer older adults of Atlantic Canada permanently disabled. The overall savings could amount to almost \$23 million annually.

³ Centers for Disease Control and Prevention (2000). Working to Prevent and Control Injury in the United States - Fact Book for the Year 2000. National Center for Injury Prevention and Control, Atlanta.

Michael's Story

Eleven-year-old Michael was playing with friends outside his Dartmouth home on a summer evening in 2001. Michael climbed a small oak tree in the yard and slipped, causing him to fall five to ten feet down an embankment hitting his head on a stone wall before striking a neighbour's parked car. Within a half hour of Michael being home, his mother noticed that he was disoriented. She

rushed him to the children's hospital Emergency Department where he was diagnosed with a fracture at the base of his skull. Michael remained at the hospital for 20 hours before he was able to return home. He still experiences frequent headaches, but no other apparent effects from his fall. Michael is now thirteen and very active in his favourite sports.

FALLS FOR THOSE 0 TO 9 YEARS OF AGE

Injuries from falls of those 0 to 9 years of age cost the people of Atlantic Canada \$56 million every year. These are falls that can be prevented by constructing safe playgrounds (e.g. that address both height issues and impact absorbing surfacing), targeting hazards in the home (e.g. providing stair gates, window guards), modifying/removing equipment known to be dangerous (e.g. mobile baby walkers), and teaching caregivers and older children how to anticipate and manage potentially risky situations. Bicycle injuries for those under 14 cost Atlantic Canada \$21 million. Mandatory bike helmet use is a proven injury prevention intervention. (Macpherson et al., 2002) As said previously, one dollar spent on bike helmets saves \$29 in treatment costs.

If these types of prevention strategies reduce the incidence of falls by 20 per cent for those aged 0-9, the current analysis suggests there would be 131 fewer hospitalized cases in Atlantic Canada, almost 1,200 fewer non-hospitalized injuries, and almost 50 fewer injuries leading to permanent disability. The net savings could total over \$11 million every year.

PREVENTING MOTOR VEHICLE CRASHES

Wearing seat belts and the use of air bags can reduce motor vehicle injuries by 61 per cent. Drinking and driving is responsible for about 40 per cent of all fatal motor vehicle crashes. It is estimated that mortality can be reduced by 20 per cent through a reduction in impaired driving. Reducing speed limits by 10 km an hour could lead to a 15 per cent decrease in mortality, with the number of deaths lowered and severity of injury reduced. If children were consistently traveling in vehicles in the appropriate child restraint, installed correctly, approximately 50 percent of fatalities could be prevented.

The current analysis suggests that with a 10 per cent reduction in crashes caused by poor road design and maintenance, and based on the assumption that 20 per cent of those injured end up in hospital, there would be about 103 fewer deaths each year. By implementing a prevention strategy based on buckling up, driving sober, slowing down and looking first on the roads, there would also be almost 560

fewer hospitalizations, about 1,200 fewer injuries treated outside a hospital setting and about 134 fewer injuries leading to permanent disability. The net savings to the people of Atlantic Canada would amount to approximately \$64 million annually.

PUTTING A PRICE TAG ON PREVENTION

Preventing injuries saves money and lives. The goal of reducing costs and human suffering can be reached by better integrating existing government and community-based programs. This would entail enhancing current initiatives within a more encompassing strategy within each province and for the Atlantic region.

A recent study estimated that diabetes costs the Canadian economy \$1.1 billion annually. In response, governments and non-governmental organizations devised and funded a five-year, \$115 million Canadian Diabetes Strategy. This adds to the list of several national strategies for various health conditions. A key question emerges: Are the economic costs of unintentional injury comparable to other priority areas?

Nationally, the annual societal costs for unintentional injury amount to almost \$9 billion. In comparison to other health conditions, unintentional injury would rank in the top five in terms of societal economic burden. In Britain, unintentional injury was established as one of the top five national health priorities. The issue is not investing in one health or societal problem at the expense of another. Rather, the key issue is the funding and formulation of a strategy. We know that strategies are essential to the control of many societal problems. The findings of this study point to the pay-offs that the Atlantic Provinces could reap through investing in and further enhancing the current investments in injury prevention and control and research. Importantly, strong provincial responses could be substantially enhanced through integration with and investments from a national strategy. At this point in time, Canada does not have a national strategy for injury prevention and control.

THE POLICY CONTEXT

Progress towards developing a national injury prevention strategy has been made in the past.

But it has not moved forward. For example, strategists working in 1991 on a project entitled *A Safer Canada: Year 2000 Injury Control Objectives* developed a series of prevention objectives. They recommended that the Government of Canada recognize injuries as a major cause of death and disability that requires a national prevention strategy. They encouraged the development of national injury control objectives for the purpose of stimulating projects across the country. They also called for the establishment of a national injury surveillance system.

None of the recommendations has been fully realized. Atlantic Canada can become a leader. The results of *The Economic Burden of Unintentional Injury in Atlantic Canada* demonstrate that provincial injury prevention responses are not only essential, they are integral to the fight against this silent epidemic.

While it goes without saying that the primary goal is to reduce human pain and suffering, the societal implications also have to be made clear. Unintentional injury is the number one killer of young Canadians (Statistics Canada, 2000). As our population ages and as we move towards a new economy, Atlantic Canada's and Canada's future is dependent on this shrinking body of human capital. We can ill afford the current losses in face of the demographic and economic changes that lie ahead. Atlantic Canada's prosperity is heavily dependent on this human capital.

RECOMMENDING ACTION FOR CHANGE

Preventable injuries harm and end the lives of many people in Atlantic Canada and exact a heavy toll on the region's limited health and financial resources. Provincial Injury Prevention and Control Strategies in concert with a regional Atlantic Strategy and a National Injury Prevention and Control Strategy are needed now.

WHY DEVELOP A STRATEGY?

A coordinated injury prevention and control strategy is fundamental to building upon existing activities and resources within local, provincial and regional communities while at the same time, eliminating duplication of efforts. A strategy is essential in order to

determine priorities, target groups at risk, and to identify and evaluate interventions.

This strategy must be guided by strong leadership and be supported by varied collaborative efforts across injury prevention groups. Collaboration will help facilitate the establishment of priorities and will ensure diverse and innovative approaches to prevention.

WHAT ARE THE ELEMENTS OF AN EFFECTIVE STRATEGY?

There are many important elements that make up an effective strategy including (IMPACT, 2002):

- Leadership
- Coordination of existing and emerging initiatives to ensure efficient use of scarce resources
- Sustainable funding source(s)
- Administrative structure
- Scope & mandate of the both the Strategy and its leadership
- Accountability
- Autonomy from government for implementation of legislative or policy recommendations
- Capacity to link with academic facilities to build research
- Timely access to data

Issues such as a strong infrastructure to support a strategy as well as leadership from a variety of injury prevention stakeholders are key in moving towards an effective and long-term commitment to injury prevention and control. To ensure results, it is imperative to address the issues of data collection and dissemination as well as the complexity of comprehensive programming.

1. Infrastructure

Comprehensive Programming

Experts agree that most injuries do not occur at random and are therefore predictable and preventable. The scope of injury is broad and by necessity, so are the programs developed to reduce its burden.

Injury prevention strategies focus primarily on environmental design (e.g., road construction, product design), education, and legislative and regulatory requirements that support environmental and behavioral change. Some programs have proven to be effective in preventing injuries such as use of seat belts and bicycle helmets, and enforcement of laws regarding drinking and driving and speeding. It is important to note that in order to successfully prevent injuries and reduce the severity of an injury, programs must reflect the diversity of the injury issue. Comprehensive programs must address not only education but also the environment, human behaviour, legislation and policy. Programs are more successful if a combination of approaches is used.

Because a range of complex factors causes injuries, injury reduction measures require collaboration and coordination among many sectors of society. Government sectors – such as health, transportation, labour, education, sports and recreation, and justice at the federal, provincial and municipal levels can contribute significantly to these efforts. Locally, police, fire, emergency medical services, town planning, traffic management, employers, schools and community organizations all play a significant role in injury prevention.

Data – Surveillance and Dissemination

In order to prevent an injury, one must know who is getting injured, how they are getting injured and what happens to them after they are injured. One must know things like the age, and sex of those injured as well as the circumstances and mechanism of injury. These factors will help to identify specific injury prevention strategies targeting high-risk groups as well as the most common and costly causes of injury. Ongoing monitoring or surveillance permits the evaluation of the impact of specific interventions.

This information comes from data, many types of which are already being collected, but not necessarily analyzed and disseminated in a manner that is accessible to and timely for injury prevention stakeholders. A strategy will facilitate the acquisition, analysis and dissemination of important data.

Research & Evaluation

While implementing specific injury prevention initiatives is important, there is also a fiscal

responsibility to ensure that the interventions are effective in reducing the burden of injury. Cost-benefit projections for proposed strategies need to be developed as well as cost-benefit evaluation for programs already in place. Research is still needed in some injury issues or with some populations at risk to determine the elements of an effective strategy to reduce injuries in these instances.

2. Leadership

Provincial Injury Prevention Strategies will provide leadership harnessed by strong collaboration, supported by excellent data and surveillance systems, and kept alive by comprehensive research and evaluation programs. By investing in an Injury Prevention Strategy, Atlantic Canada will no longer be able to call the injury epidemic 'silent'. People will begin to see the risks in their lives. They will begin to understand how to manage these risks, ultimately saving both money and lives.

In general, there is a growing range of injury prevention activities in the region that make it an opportune time to coordinate and focus efforts for optimal results. Recognizing that many of these local and provincial organizations are focusing on various aspects and topics related to injury prevention, sample initiatives that span the four provinces or that are relatively recent, are outlined below:

- **Inter-provincial collaboration:** The Atlantic Network for Injury Prevention (ANIP) was established in late 2000. ANIP is a network of over 175 individuals and organizations working to provide opportunities to facilitate collaboration and coordination of injury prevention activities within Atlantic Canada. ANIP has been instrumental in facilitating provincial networks/coalitions and two Atlantic conferences to bring together individuals and organizations committed to reducing the burden of injury in Atlantic Canada. SMARTRISK has provided funding for a part time Secretariat and electronic infrastructure for the Network.
- **Acknowledgement by provincial governments of the issue:** Some provinces have started to incorporate injury as an important health issue to consider in planning wellness strategies.

- Issue-specific initiatives:

Falls prevention: The inclusion of Atlantic Canada as one of the pilot sites for the Health Canada/Veteran's Affairs Falls Prevention Initiative, which aims to reduce the incidence of falls in this population, has created opportunities for an increasing number of sectors to work together on this major injury issue. This has been the catalyst for many community-based fall prevention activities for veterans and seniors throughout the region.

Motor vehicle related injuries: Vision 2010, to make Canada's roads the safest in the world, was adopted by the Canadian Council of Motor Transport Administrators (CCMTA) in 2000, as a renewal and expansion of the original Vision 2001. It has brought increased focused attention and activity in Atlantic Canada to address the burden of traffic related injury and death.

Children's injuries: Many communities partner with Safe Kids Canada on activities to reduce the incidence of injury in children, particularly during the yearly theme-specific Safe Kids Week as well as national advocacy initiatives; Child Safety Link, located at the IWK Health Centre, now has as its mission to reduce the incidence and severity of injuries to children and youth across the Maritimes.

Agricultural safety: The Canadian Agriculture Safety Program (CASP) has funded projects within each Atlantic province over the past number of years, and Atlantic Canada has participated in the Canadian Agricultural Injury Surveillance Program (CAISP). Both programs have brought needed attention to this particular injury issue.

- Holistic Initiatives: Several communities in Atlantic Canada are striving to achieve 'Safe Communities' designation, working with the Safe Communities Foundation to address, in a comprehensive way, the range of injury issues within their community.

Given that the resources for developing a Provincial Injury Prevention and Control Strategy are likely to come from provincial budgets, the approach may vary from province to province within the region. Regardless of the strategy adopted by each province, tremendous value will be achieved by building

synergy through an Atlantic Strategy of expanded Atlantic regional collaboration and information sharing. Moreover, provincial and Atlantic activities need to be coordinated with a National Injury Prevention Strategy.

CONCLUSION

Every hour of every day, 36 people in Atlantic Canada are unintentionally injured (over 860/day), roughly 2 people in Atlantic Canada die daily from these injuries and almost 6,700 are disabled every year. Overall, almost 316,000 residents of Atlantic Canada are injured each year.

Acknowledging the need to act is the first step. The next step is to bring together the key players and stakeholders to devise, resource and operationalize strategies in each Atlantic province. The rationale is clear. Unintentional injuries cost Atlantic Canada \$1.2 Billion. The consequences for not acting are far reaching for this significant health and societal problem. This is a challenge requiring a truly integrated response involving a partnership between provincial governments, the federal government, non-governmental, regional and community-based organizations involved in injury prevention and control. The key to success is to recognize that we can tackle this problem and achieve great results together. We must challenge this health and societal threat in Atlantic Canada. Together we can make the difference!

APPENDICES

APPENDIX A DETAILED TABLES

ATLANTIC REGION

TABLE ATL-1*

**Deaths Resulting from Unintentional Injury
Distribution by Major Category**
Atlantic, 1999

| Major Cause of Death | Number | % Distribution |
|-----------------------------|---------------|-----------------------|
| Motor Vehicle Crashes | 265 | 38.9% |
| Falls | 227 | 33.3% |
| Drowning and Suffocation | 57 | 8.4% |
| Fires | 27 | 4.0% |
| Poisoning | 23 | 3.4% |
| Water Transport | 6 | 0.9% |
| Air & Space | 1 | 0.1% |
| Other | 76 | 11.1% |
| Total | 682 | 100.0% |

* This table is revised from the original printing

TABLE ATL-2

**Unintentional Injuries Resulting in Hospitalization
Distribution by Major Category**
Atlantic, 1999

| Major Cause | Number | % Distribution |
|--------------------------|---------------|-----------------------|
| Falls | 9,336 | 51.8% |
| Motor Vehicle Crashes | 2,021 | 11.2% |
| Poisoning | 482 | 2.7% |
| Pedal Cycle | 273 | 1.5% |
| Fires | 156 | 0.9% |
| Water Transport | 79 | 0.4% |
| Drowning and Suffocation | 21 | 0.1% |
| Air & Space | 10 | 0.1% |
| Railway | 5 | 0.0% |
| Other | 5,629 | 31.3% |
| Total | 18,012 | 100.0% |

TABLE ATL-3

**Unintentional Injuries Resulting in Non-Hospitalization
Distribution by Major Category**
Atlantic, 1999

| Major Cause | Number | % Distribution |
|--------------------------|----------------|-----------------------|
| Falls | 104,082 | 35.0% |
| Motor Vehicle Crashes | 14,344 | 4.8% |
| Poisoning | 5,500 | 1.9% |
| Fires | 3,449 | 1.2% |
| Pedal Cycle | 3,100 | 1.0% |
| Water Transport | 1,229 | 0.4% |
| Drowning and Suffocation | 195 | 0.1% |
| Air & Space | 125 | 0.0% |
| Railway | 93 | 0.0% |
| Other | 164,942 | 55.5% |
| Total | 297,059 | 100.0% |

Note: The Atlantic Region was modeled separately from the individual provinces. Due to this, and rounding, the provincial values may not sum to the regional totals.

TABLE ATL-4

**Unintentional Injuries Resulting in Disability
Distribution by Major Category**
Atlantic, 1999

| Major Cause | Partial Permanent Disability | Total Permanent Disability |
|--------------------------|---|---|
| Falls | 3,391 | 247 |
| Motor Vehicle Crashes | 495 | 68 |
| Fires | 77 | 4 |
| Poisoning | 102 | 3 |
| Pedal Cycle | 89 | 9 |
| Water Transport | 28 | 2 |
| Drowning and Suffocation | 5 | 2 |
| Air & Space | 4 | 0 |
| Railway | 2 | 0 |
| Other | 2,008 | 135 |
| Total | 6,201 | 471 |

TABLE ATL-5

**Direct Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Expenditure**
Atlantic, 1999

| Expenditure Category | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|-------------------------------|--------------------------------------|------------------|---|------------------|----------------|------------------|------------------|
| | Hospitalized Cases | | | | | | |
| <i>Hospital</i> | 12,262.7 | 60,747.0 | 77.2 | 1,608.2 | 1,320.2 | 22,062.1 | 98,077.3 |
| <i>Medical</i> | 10,717.9 | 46,887.8 | 59.6 | 1,181.9 | 544.9 | 17,683.9 | 77,076.0 |
| <i>Rehabilitation</i> | 793.3 | 3,053.8 | 13.1 | 134.1 | 40.3 | 1,502.6 | 5,537.2 |
| Sub-Total | 23,774.0 | 110,688.5 | 149.9 | 2,924.2 | 1,905.3 | 41,248.6 | 180,690.5 |
| Non-Hospitalized Cases | | | | | | | |
| <i>Medical</i> | 5,634.4 | 54,070.3 | 76.8 | 3,876.2 | 1,339.5 | 58,906.4 | 123,903.5 |
| <i>Rehabilitation</i> | 373.9 | 3,615.4 | 9.6 | 50.7 | 215.6 | 4,743.7 | 9,009.0 |
| Sub-Total | 6,008.3 | 57,685.7 | 86.4 | 3,926.9 | 1,555.1 | 63,650.1 | 132,912.5 |
| Permanent Disability | 45,848.4 | 151,910.3 | 473.5 | 7,223.9 | 3,493.0 | 149,540.7 | 358,489.7 |
| Total Direct | 75,630.7 | 320,284.5 | 709.8 | 14,074.9 | 6,953.4 | 254,439.4 | 672,092.8 |

TABLE ATL-6

**Indirect Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Productivity Loss**
Atlantic, 1999

| Category of Productivity Loss | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|--|--------------------------------------|------------------|---|------------------|-----------------|------------------|------------------|
| | Morbidity Costs | | | | | | |
| <i>Cases While Hospitalized</i> | 670.5 | 1,052.4 | 2.0 | 74.0 | 45.8 | 1,384.5 | 3,229.3 |
| <i>Partial Permanent Disability</i> | 27,158.4 | 75,873.0 | 268.6 | 5,272.3 | 4,301.4 | 115,942.2 | 228,815.9 |
| <i>Total Permanent Disability</i> | 22,590.4 | 36,892.5 | 300.7 | 1,013.1 | 1,242.9 | 48,852.6 | 110,892.2 |
| Sub-Total | 50,419.4 | 113,817.8 | 571.3 | 6,359.4 | 5,590.1 | 166,179.3 | 342,937.4 |
| Mortality Costs | | | | | | | |
| | 84,404.9 | 5,883.6 | 18,094.2 | 6,427.3 | 8,228.9 | 21,604.5 | 144,643.5 |
| Total Costs | 134,824.3 | 119,701.5 | 18,665.5 | 12,786.7 | 13,819.0 | 187,783.8 | 487,580.8 |

TABLE ATL-7

**Total Economic Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Productivity Loss**
Atlantic, 1999

| Cost Category | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|-------------------------------|--------------------------------------|------------------|---|------------------|-----------------|------------------|--------------------|
| Direct Costs | | | | | | | |
| <i>Hospitalized Cases</i> | 23,774.0 | 110,688.5 | 149.9 | 2,924.2 | 1,905.3 | 41,248.6 | 180,690.5 |
| <i>Non-Hospitalized Cases</i> | 6,008.3 | 57,685.7 | 86.4 | 3,926.9 | 1,555.1 | 63,650.1 | 132,912.5 |
| <i>Disability</i> | 45,848.4 | 151,910.3 | 473.5 | 7,223.9 | 3,493.0 | 149,540.7 | 358,489.7 |
| Total Direct | 75,630.7 | 320,284.5 | 709.8 | 14,074.9 | 6,953.4 | 254,439.4 | 672,092.8 |
| Indirect Costs | | | | | | | |
| <i>Morbidity Costs</i> | 50,419.4 | 113,817.8 | 571.3 | 6,359.4 | 5,590.1 | 166,179.3 | 342,937.4 |
| <i>Mortality Costs</i> | 84,404.9 | 5,883.6 | 18,094.2 | 6,427.3 | 8,228.9 | 21,604.5 | 144,643.5 |
| Total Indirect | 134,824.3 | 119,701.5 | 18,665.5 | 12,786.7 | 13,819.0 | 187,783.8 | 487,580.8 |
| Total Costs | 210,455.0 | 439,986.0 | 19,375.3 | 26,861.6 | 20,772.5 | 442,223.2 | 1,159,673.6 |

TABLE ATL-8

**Summary of Total Economic Costs Resulting from Unintentional Injury
Distribution by Major Cause of Injury**
Atlantic, 1999

| Cause of Injury | Total Cost | Direct Cost | Indirect Cost |
|--------------------------|------------------------|----------------------|----------------------|
| Falls | 439,985,975 | 320,284,514 | 119,701,461 |
| Motor Vehicle | 210,454,992 | 75,630,667 | 134,824,325 |
| Poisoning | 26,861,575 | 14,074,872 | 12,786,703 |
| Fires | 20,772,495 | 6,953,445 | 13,819,050 |
| Pedal Cycle | 20,736,209 | 11,001,026 | 9,735,183 |
| Drowning and Suffocation | 19,375,304 | 709,828 | 18,665,476 |
| Water Transport | 6,817,842 | 2,990,412 | 3,827,430 |
| Air and Space | 1,226,187 | 462,825 | 763,362 |
| Railway | 348,065 | 271,603 | 76,463 |
| Other | 413,094,941 | 239,713,560 | 173,381,381 |
| Total | \$1,159,673,585 | \$672,092,752 | \$487,580,833 |

TABLE ATL-9

**Percent Distribution of Total Costs
by Major Category**
Atlantic, 1999

| Cause of Injury | Total Cost | % of Total |
|--------------------------|----------------------|-------------------|
| Falls | 439,985,975 | 37.9% |
| Motor Vehicle | 210,454,992 | 18.1% |
| Poisoning | 26,861,575 | 2.3% |
| Fires | 20,772,495 | 1.8% |
| Pedal Cycle | 20,736,209 | 1.8% |
| Drowning and Suffocation | 19,375,304 | 1.7% |
| Water Transport | 6,817,842 | 0.6% |
| Air and Space | 1,226,187 | 0.1% |
| Railway | 348,065 | 0.0% |
| Other | 413,094,941 | 35.6% |
| Total | 1,159,673,585 | 100.0% |

TABLE ATL-10

Scenario: Population Effects on Economic Costs of Unintentional Injury
Atlantic, 1999

| Year | Population | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|-------------------|-------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 1999 | 2,373,185 | \$1,159.7 | \$672.1 | \$487.6 |
| 2010 | 2,594,505 | \$1,273.8 | \$767.3 | \$506.5 |
| % Increase | 9.3% | 9.8% | 14.2% | 3.9% |

SENSITIVITY TABLES – ATL

Change of Discount Rate

| Discount Rate | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|----------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 3% (Base Case) | \$1,159.7 | \$672.1 | \$487.6 |
| 5% | \$929.8 | \$566.8 | \$363.0 |
| % Change | -19.8% | -15.7% | -25.5% |

Change of Unemployment Rate

| Unemployment Rate | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|--------------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 11.63% (Base Case) | \$1,159.7 | \$672.1 | \$487.6 |
| 9% | \$1,176.2 | \$672.1 | \$504.1 |
| % Increase | 1.4% | N/A | 3.4% |

NEW BRUNSWICK

TABLE NB-1

**Deaths Resulting from Unintentional Injury
Distribution by Major Category**
New Brunswick, 1999

| Major Cause of Death | Number | % Distribution |
|-----------------------------|---------------|-----------------------|
| Motor Vehicle Crashes | 116 | 44.4% |
| Falls | 81 | 31.0% |
| Drowning and Suffocation | 13 | 5.0% |
| Fires | 9 | 3.4% |
| Poisoning | 7 | 2.7% |
| Water Transport | 2 | 0.8% |
| Air & Space | 0 | 0.0% |
| Other | 33 | 12.6% |
| Total | 261 | 100.0% |

TABLE NB-2

**Unintentional Injuries Resulting in Hospitalization
Distribution by Major Category**
New Brunswick, 1999

| Major Cause | Number | % Distribution |
|--------------------------|---------------|-----------------------|
| Falls | 3,719 | 47.3% |
| Motor Vehicle Crashes | 857 | 10.9% |
| Poisoning | 196 | 2.5% |
| Pedal Cycle | 115 | 1.5% |
| Fires | 46 | 0.6% |
| Water Transport | 13 | 0.2% |
| Drowning and Suffocation | 5 | 0.1% |
| Air & Space | 3 | 0.0% |
| Railway | 1 | 0.0% |
| Other | 2,915 | 37.0% |
| Total | 7,870 | 100.0% |

TABLE NB-3

**Unintentional Injuries Resulting in Non-Hospitalization
Distribution by Major Category**
New Brunswick, 1999

| Major Cause | Number | % Distribution |
|--------------------------|----------------|-----------------------|
| Falls | 41,438 | 30.3% |
| Motor Vehicle Crashes | 4,743 | 3.5% |
| Poisoning | 2,198 | 1.6% |
| Pedal Cycle | 1,298 | 0.9% |
| Fires | 1,017 | 0.7% |
| Water Transport | 202 | 0.1% |
| Drowning and Suffocation | 46 | 0.0% |
| Air & Space | 37 | 0.0% |
| Railway | 19 | 0.0% |
| Other | 85,959 | 62.8% |
| Total | 136,957 | 100.0% |

TABLE NB-4

**Unintentional Injuries Resulting in Disability
Distribution by Major Category**
New Brunswick, 1999

| Major Cause | Partial Permanent Disability | Total Permanent Disability |
|--------------------------|---|---|
| Falls | 1,349 | 99 |
| Motor Vehicle Crashes | 191 | 28 |
| Fires | 23 | 1 |
| Poisoning | 41 | 1 |
| Pedal Cycle | 38 | 4 |
| Water Transport | 5 | 0 |
| Drowning and Suffocation | 1 | 0 |
| Air & Space | 1 | 0 |
| Railway | 0 | 0 |
| Other | 1,046 | 70 |
| Total | 2,695 | 204 |

TABLE NB-5

**Direct Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Expenditure**
New Brunswick, 1999

| Expenditure Category | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|-----------------------------|--------------------------------------|------------------|---|------------------|----------------|------------------|------------------|
| Hospitalized Cases | | | | | | | |
| <i>Hospital</i> | 5,245.7 | 21,439.5 | 22.1 | 494.5 | 389.4 | 9,226.0 | 36,817.2 |
| <i>Medical</i> | 4,592.8 | 16,553.2 | 17.4 | 352.8 | 160.7 | 7,408.9 | 29,085.8 |
| <i>Rehabilitation</i> | 337.9 | 1,078.6 | 2.2 | 39.7 | 11.9 | 620.1 | 2,090.4 |
| Sub-Total | 10,176.5 | 39,071.3 | 41.7 | 887.0 | 562.0 | 17,255.0 | 67,993.4 |
| Non-Hospitalized Cases | | | | | | | |
| <i>Medical</i> | 1,864.9 | 19,086.2 | 34.3 | 1,153.3 | 395.1 | 24,280.7 | 46,814.5 |
| <i>Rehabilitation</i> | 123.9 | 1,282.0 | 4.6 | 21.5 | 63.6 | 1,953.0 | 3,448.7 |
| Sub-Total | 1,988.8 | 20,368.2 | 38.9 | 1,174.9 | 458.7 | 26,233.7 | 50,263.2 |
| Permanent Disability | 18,816.3 | 61,537.6 | 124.7 | 2,936.8 | 955.4 | 75,026.2 | 159,396.9 |
| Total Direct | 30,981.6 | 120,977.0 | 205.3 | 4,998.6 | 1,976.1 | 118,514.9 | 277,653.5 |

TABLE NB-6

**Indirect Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Productivity Loss**
New Brunswick, 1999

| Category of Productivity Loss | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|--|--------------------------------------|-----------------|---|------------------|----------------|-----------------|------------------|
| Morbidity Costs | | | | | | | |
| <i>Cases While Hospitalized</i> | 391.0 | 375.7 | 0.6 | 21.8 | 16.3 | 664.4 | 1,469.8 |
| <i>Partial Permanent Disability</i> | 11,030.1 | 32,903.7 | 66.2 | 2,133.6 | 1,193.4 | 61,620.6 | 108,947.6 |
| <i>Total Permanent Disability</i> | 9,775.2 | 16,045.4 | 97.8 | 361.2 | 344.9 | 25,502.8 | 52,127.2 |
| Sub-Total | 21,196.3 | 49,324.8 | 164.6 | 2,516.5 | 1,554.6 | 87,787.8 | 162,544.6 |
| Mortality Costs | | | | | | | |
| | 38,750.0 | 2,043.6 | 4,022.7 | 1,778.0 | 2,973.7 | 11,856.9 | 61,424.9 |
| Total Costs | 59,946.3 | 51,368.4 | 4,187.3 | 4,294.5 | 4,528.3 | 99,644.7 | 223,969.5 |

TABLE NB-7

**Total Economic Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Productivity Loss**
New Brunswick, 1999

| Cost Category | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|-------------------------------|--------------------------------------|------------------|---|------------------|----------------|------------------|------------------|
| Direct Costs | | | | | | | |
| <i>Hospitalized Cases</i> | 10,176.5 | 39,071.3 | 41.7 | 887.0 | 562.0 | 17,255.0 | 67,993.4 |
| <i>Non-Hospitalized Cases</i> | 1,988.8 | 20,368.2 | 38.9 | 1,174.9 | 458.7 | 26,233.7 | 50,263.2 |
| <i>Disability</i> | 18,816.3 | 61,537.6 | 124.7 | 2,936.8 | 955.4 | 75,026.2 | 159,396.9 |
| Total Direct | 30,981.6 | 120,977.0 | 205.3 | 4,998.6 | 1,976.1 | 118,514.9 | 277,653.5 |
| Indirect Costs | | | | | | | |
| <i>Morbidity Costs</i> | 21,196.3 | 49,324.8 | 164.6 | 2,516.5 | 1,554.6 | 87,787.8 | 162,544.6 |
| <i>Mortality Costs</i> | 38,750.0 | 2,043.6 | 4,022.7 | 1,778.0 | 2,973.7 | 11,856.9 | 61,424.9 |
| Total Indirect | 59,946.3 | 51,368.4 | 4,187.3 | 4,294.5 | 4,528.3 | 99,644.7 | 223,969.5 |
| Total Costs | 90,927.9 | 172,345.4 | 4,392.6 | 9,293.1 | 6,504.4 | 218,159.6 | 501,623.0 |

TABLE NB-8

**Summary of Total Economic Costs Resulting from Unintentional Injury
Distribution by Major Cause of Injury**
New Brunswick, 1999

| Cause of Injury | Total Cost | Direct Cost | Indirect Cost |
|--------------------------|----------------------|----------------------|----------------------|
| Falls | 172,345,397 | 120,977,015 | 51,368,382 |
| Motor Vehicle | 90,927,909 | 30,981,565 | 59,946,344 |
| Poisoning | 9,293,133 | 4,998,643 | 4,294,490 |
| Pedal Cycle | 8,304,481 | 4,302,573 | 4,001,908 |
| Fires | 6,504,446 | 1,976,109 | 4,528,337 |
| Drowning and Suffocation | 4,392,560 | 205,283 | 4,187,277 |
| Water Transport | 1,709,725 | 547,524 | 1,162,201 |
| Air and Space | 180,047 | 108,920 | 71,127 |
| Railway | 86,181 | 48,575 | 37,606 |
| Other | 207,879,169 | 113,507,298 | 94,371,871 |
| Total | \$501,623,048 | \$277,653,506 | \$223,969,542 |

TABLE NB-9

**Percent Distribution of Total Costs
by Major Category**
New Brunswick, 1999

| Cause of Injury | Total Cost | % of Total |
|--------------------------|--------------------|-------------------|
| Falls | 172,345,397 | 34.4% |
| Motor Vehicle | 90,927,909 | 18.1% |
| Poisoning | 9,293,133 | 1.9% |
| Pedal Cycle | 8,304,481 | 1.7% |
| Fires | 6,504,446 | 1.3% |
| Drowning and Suffocation | 4,392,560 | 0.9% |
| Water Transport | 1,709,725 | 0.3% |
| Air and Space | 180,047 | 0.0% |
| Railway | 86,181 | 0.0% |
| Other | 207,879,169 | 41.4% |
| Total | 501,623,048 | 100.0% |

TABLE NB-10

Scenario: Population Effects on Economic Costs of Unintentional Injury
New Brunswick, 1999

| Year | Population | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|-------------------|-------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 1999 | 754,969 | \$501.6 | \$277.7 | \$224.0 |
| 2010 | 825,376 | \$546.8 | \$315.1 | \$231.7 |
| % Increase | 9.3% | 9.0% | 13.5% | 3.5% |

SENSITIVITY TABLES – NB

Change of Discount Rate

| Discount Rate | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|----------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 3% (Base Case) | \$501.6 | \$277.7 | \$224.0 |
| 5% | \$397.2 | \$230.5 | \$166.7 |
| % Change | -20.8% | -17.0% | -25.6% |

Change of Unemployment Rate

| Unemployment Rate | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|--------------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 10.22% (Base Case) | \$501.6 | \$277.7 | \$224.0 |
| 7% | \$509.1 | \$277.7 | \$231.5 |
| % Increase | 1.5% | N/A | 3.3% |

NEWFOUNDLAND and LABRADOR

TABLE NL-1

**Deaths Resulting from Unintentional Injury
Distribution by Major Category
Newfoundland, 1999**

| Major Cause of Death | Number | % Distribution |
|--------------------------|------------|----------------|
| Falls | 46 | 35.9% |
| Motor Vehicle Crashes | 36 | 28.1% |
| Drowning and Suffocation | 17 | 13.3% |
| Fires | 8 | 6.3% |
| Water Transport | 2 | 1.6% |
| Poisoning | 1 | 0.8% |
| Air & Space | 1 | 0.8% |
| Railway | 0 | 0.0% |
| Other | 17 | 13.3% |
| Total | 128 | 100.0% |

TABLE NL-2

**Unintentional Injuries Resulting in Hospitalization
Distribution by Major Category
Newfoundland, 1999**

| Major Cause | Number | % Distribution |
|--------------------------|--------------|----------------|
| Falls | 1,691 | 49.0% |
| Motor Vehicle Crashes | 393 | 11.4% |
| Poisoning | 126 | 3.6% |
| Pedal Cycle | 64 | 1.9% |
| Fires | 39 | 1.1% |
| Water Transport | 38 | 1.1% |
| Drowning and Suffocation | 8 | 0.2% |
| Air & Space | 3 | 0.1% |
| Railway | 0 | 0.0% |
| Other | 1,091 | 31.6% |
| Total | 3,453 | 100.0% |

TABLE NL-3

**Unintentional Injuries Resulting in Non-Hospitalization
Distribution by Major Category
Newfoundland, 1999**

| Major Cause | Number | % Distribution |
|--------------------------|---------------|----------------|
| Falls | 18,804 | 33.2% |
| Motor Vehicle Crashes | 2,955 | 5.2% |
| Poisoning | 1,541 | 2.7% |
| Fires | 862 | 1.5% |
| Pedal Cycle | 726 | 1.3% |
| Water Transport | 591 | 1.0% |
| Drowning and Suffocation | 58 | 0.1% |
| Air & Space | 37 | 0.1% |
| Railway | 0 | 0.0% |
| Other | 31,023 | 54.8% |
| Total | 56,598 | 100.0% |

TABLE NL-4

**Unintentional Injuries Resulting in Disability
Distribution by Major Category**
Newfoundland, 1999

| Major Cause | Partial Permanent Disability | Total Permanent Disability |
|--------------------------|---|---|
| Falls | 612 | 45 |
| Motor Vehicle Crashes | 92 | 13 |
| Poisoning | 29 | 1 |
| Pedal Cycle | 21 | 2 |
| Fires | 19 | 1 |
| Water Transport | 13 | 1 |
| Drowning and Suffocation | 2 | 1 |
| Air & Space | 1 | 0 |
| Railway | 0 | 0 |
| Other | 388 | 27 |
| Total | 1,177 | 91 |

TABLE NL-5

**Direct Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Expenditure**
Newfoundland, 1999

| Expenditure Category | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|-----------------------------|--------------------------------------|-----------------|---|------------------|----------------|-----------------|------------------|
| Hospitalized Cases | | | | | | | |
| <i>Hospital</i> | 2,314.7 | 9,795.4 | 34.3 | 282.1 | 266.1 | 3,821.8 | 16,514.5 |
| <i>Medical</i> | 2,010.9 | 7,582.6 | 25.8 | 202.7 | 109.8 | 3,048.0 | 12,979.8 |
| <i>Rehabilitation</i> | 152.2 | 496.6 | 8.5 | 22.8 | 8.1 | 262.8 | 951.0 |
| Sub-Total | 4,477.7 | 17,874.6 | 68.6 | 507.6 | 384.1 | 7,132.6 | 30,445.3 |
| Non-Hospitalized Cases | | | | | | | |
| <i>Medical</i> | 1,150.2 | 8,710.0 | 13.0 | 662.9 | 270.0 | 9,763.1 | 20,569.3 |
| <i>Rehabilitation</i> | 75.3 | 591.6 | 1.4 | 12.0 | 43.5 | 727.4 | 1,451.2 |
| Sub-Total | 1,225.5 | 9,301.6 | 14.4 | 675.0 | 313.5 | 10,490.5 | 22,020.5 |
| Permanent Disability | 8,865.2 | 29,888.6 | 139.3 | 1,906.9 | 899.4 | 30,178.1 | 71,877.6 |
| Total Direct | 14,568.5 | 57,064.9 | 222.3 | 3,089.4 | 1,597.0 | 47,801.3 | 124,343.3 |

TABLE NL-6

**Indirect Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Productivity Loss**
Newfoundland, 1999

| Category of Productivity Loss | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|--|--------------------------------------|-----------------|---|------------------|----------------|-----------------|-----------------|
| Morbidity Costs | | | | | | | |
| <i>Cases While Hospitalized</i> | 91.5 | 187.5 | 0.4 | 8.3 | 9.4 | 156.9 | 454.0 |
| <i>Partial Permanent Disability</i> | 4,649.0 | 14,653.7 | 63.2 | 1,415.9 | 1,076.9 | 21,397.8 | 43,256.5 |
| <i>Total Permanent Disability</i> | 3,986.8 | 7,050.2 | 83.2 | 305.4 | 311.2 | 9,362.9 | 21,099.6 |
| Sub-Total | 8,727.2 | 21,891.3 | 146.7 | 1,729.6 | 1,397.5 | 30,917.7 | 64,810.0 |
| Mortality Costs | | | | | | | |
| | 9,427.3 | 1,282.7 | 4,994.6 | 783.7 | 3,135.0 | 4,673.3 | 24,296.7 |
| Total Costs | 18,154.6 | 23,174.0 | 5,141.4 | 2,513.3 | 4,532.5 | 35,591.0 | 89,106.7 |

TABLE NL-7

**Total Economic Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Productivity Loss
Newfoundland, 1999**

| Cost Category | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|-------------------------------|--------------------------------------|-----------------|---|------------------|----------------|-----------------|------------------|
| Direct Costs | | | | | | | |
| <i>Hospitalized Cases</i> | 4,477.7 | 17,874.6 | 68.6 | 507.6 | 384.1 | 7,132.6 | 30,445.3 |
| <i>Non-Hospitalized Cases</i> | 1,225.5 | 9,301.6 | 14.4 | 675.0 | 313.5 | 10,490.5 | 22,020.5 |
| <i>Disability</i> | 8,865.2 | 29,888.6 | 139.3 | 1,906.9 | 899.4 | 30,178.1 | 71,877.6 |
| Total Direct | 14,568.5 | 57,064.9 | 222.3 | 3,089.4 | 1,597.0 | 47,801.3 | 124,343.3 |
| Indirect Costs | | | | | | | |
| <i>Morbidity Costs</i> | 8,727.2 | 21,891.3 | 146.7 | 1,729.6 | 1,397.5 | 30,917.7 | 64,810.0 |
| <i>Mortality Costs</i> | 9,427.3 | 1,282.7 | 4,994.6 | 783.7 | 3,135.0 | 4,673.3 | 24,296.7 |
| Total Indirect | 18,154.6 | 23,174.0 | 5,141.4 | 2,513.3 | 4,532.5 | 35,591.0 | 89,106.7 |
| Total Costs | 32,723.0 | 80,238.8 | 5,363.7 | 5,602.7 | 6,129.5 | 83,392.3 | 213,450.0 |

TABLE NL-8

**Summary of Total Economic Costs Resulting from Unintentional Injury
Distribution by Major Cause of Injury
Newfoundland, 1999**

| Cause of Injury | Total Cost | Direct Cost | Indirect Cost |
|--------------------------|----------------------|----------------------|----------------------|
| Falls | 80,238,825 | 57,064,862 | 23,173,963 |
| Motor Vehicle | 32,723,038 | 14,568,454 | 18,154,584 |
| Fires | 6,129,510 | 1,597,016 | 4,532,493 |
| Poisoning | 5,602,748 | 3,089,424 | 2,513,324 |
| Drowning and Suffocation | 5,363,656 | 222,299 | 5,141,357 |
| Pedal Cycle | 4,887,944 | 2,700,188 | 2,187,756 |
| Water Transport | 2,711,847 | 1,296,369 | 1,415,477 |
| Air and Space | 744,869 | 210,524 | 534,344 |
| Railway | 0 | 0 | 0 |
| Other | 75,047,597 | 43,594,183 | 31,453,414 |
| Total | \$213,450,034 | \$124,343,321 | \$89,106,713 |

TABLE NL-9

**Percent Distribution of Total Costs
by Major Category
Newfoundland, 1999**

| Cause of Injury | Total Cost | % of Total |
|--------------------------|--------------------|-------------------|
| Falls | 80,238,825 | 37.6% |
| Motor Vehicle | 32,723,038 | 15.3% |
| Fires | 6,129,510 | 2.9% |
| Poisoning | 5,602,748 | 2.6% |
| Drowning and Suffocation | 5,363,656 | 2.5% |
| Pedal Cycle | 4,887,944 | 2.3% |
| Water Transport | 2,711,847 | 1.3% |
| Air and Space | 744,869 | 0.3% |
| Railway | 0 | 0.0% |
| Other | 75,047,597 | 35.2% |
| Total | 213,450,034 | 100.0% |

TABLE NL-10

Scenario: Population Effects on Economic Costs of Unintentional Injury
Newfoundland, 1999

| Year | Population | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|-------------------|-------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 1999 | 541,000 | \$213.5 | \$124.3 | \$89.1 |
| 2010 | 591,453 | \$232.5 | \$139.4 | \$93.1 |
| % Increase | 9.3% | 8.9% | 12.1% | 4.5% |

SENSITIVITY TABLES – NL

Change of Discount Rate

| Discount Rate | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|----------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 3% (Base Case) | \$213.5 | \$124.3 | \$89.1 |
| 5% | \$168.9 | \$102.7 | \$66.2 |
| % Change | -20.9% | -17.4% | -25.7% |

Change of Unemployment Rate

| Unemployment Rate | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|--------------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 16.67% (base) | \$213.5 | \$124.3 | \$89.1 |
| 14% | \$216.7 | \$124.3 | \$92.3 |
| % Increase | 1.5% | N/A | 3.6% |

NOVA SCOTIA

TABLE NS-1

**Deaths Resulting from Unintentional Injury
Distribution by Major Category**
Nova Scotia, 1999

| Major Cause of Death | Number | % Distribution |
|--------------------------|------------|----------------|
| Motor Vehicle Crashes | 94 | 37.6% |
| Falls | 86 | 34.4% |
| Drowning and Suffocation | 25 | 10.0% |
| Fires | 10 | 4.0% |
| Poisoning | 7 | 2.8% |
| Air & Space | 0 | 0.0% |
| Water Transport | 0 | 0.0% |
| Other | 28 | 11.2% |
| Total | 250 | 100.0% |

TABLE NS-2

**Unintentional Injuries Resulting in Hospitalization
Distribution by Major Category**
Nova Scotia, 1999

| Major Cause | Number | % Distribution |
|--------------------------|--------------|----------------|
| Falls | 3,034 | 55.3% |
| Motor Vehicle Crashes | 611 | 11.1% |
| Pedal Cycle | 75 | 1.4% |
| Fires | 56 | 1.0% |
| Poisoning | 43 | 0.8% |
| Water Transport | 24 | 0.4% |
| Drowning and Suffocation | 8 | 0.1% |
| Railway | 4 | 0.1% |
| Air & Space | 4 | 0.1% |
| Other | 1,627 | 29.7% |
| Total | 5,486 | 100.0% |

TABLE NS-3

**Unintentional Injuries Resulting in Non-Hospitalization
Distribution by Major Category**
Nova Scotia, 1999

| Major Cause | Number | % Distribution |
|--------------------------|---------------|----------------|
| Falls | 36,842 | 43.8% |
| Motor Vehicle Crashes | 5,715 | 6.8% |
| Fires | 1,238 | 1.5% |
| Pedal Cycle | 857 | 1.0% |
| Poisoning | 617 | 0.7% |
| Water Transport | 373 | 0.4% |
| Drowning and Suffocation | 91 | 0.1% |
| Railway | 74 | 0.1% |
| Air & Space | 50 | 0.1% |
| Other | 38,199 | 45.4% |
| Total | 84,057 | 100.0% |

TABLE NS-4

**Unintentional Injuries Resulting in Disability
Distribution by Major Category**
Nova Scotia, 1999

| Major Cause | Partial Permanent Disability | Total Permanent Disability |
|--------------------------|---|---|
| Falls | 1,201 | 87 |
| Motor Vehicle Crashes | 176 | 22 |
| Fires | 28 | 1 |
| Pedal Cycle | 25 | 2 |
| Poisoning | 17 | 1 |
| Water Transport | 8 | 1 |
| Drowning and Suffocation | 2 | 1 |
| Railway | 2 | 0 |
| Air & Space | 1 | 0 |
| Other | 465 | 31 |
| Total | 1,925 | 145 |

TABLE NS-5

**Direct Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Expenditure**
Nova Scotia, 1999

| Expenditure Category | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|-----------------------------|--------------------------------------|------------------|---|------------------|----------------|-----------------|------------------|
| Hospitalized Cases | | | | | | | |
| <i>Hospital</i> | 3,889.6 | 26,112.1 | 20.0 | 767.5 | 608.9 | 7,569.7 | 38,967.8 |
| <i>Medical</i> | 3,404.3 | 20,133.5 | 15.9 | 578.0 | 251.3 | 6,076.9 | 30,459.9 |
| <i>Rehabilitation</i> | 251.6 | 1,308.1 | 2.2 | 66.1 | 18.6 | 518.4 | 2,165.0 |
| Sub-Total | 7,545.4 | 47,553.7 | 38.2 | 1,411.5 | 878.8 | 14,165.1 | 71,592.7 |
| Non-Hospitalized Cases | | | | | | | |
| <i>Medical</i> | 2,342.9 | 23,257.0 | 29.6 | 1,900.6 | 617.8 | 20,741.5 | 48,889.3 |
| <i>Rehabilitation</i> | 156.4 | 1,542.0 | 3.5 | 15.8 | 99.5 | 1,754.5 | 3,571.6 |
| Sub-Total | 2,499.3 | 24,799.0 | 33.1 | 1,916.3 | 717.2 | 22,495.9 | 52,461.0 |
| Permanent Disability | 14,592.9 | 50,775.9 | 206.7 | 1,987.3 | 1,287.9 | 34,361.5 | 103,212.3 |
| Total Direct | 24,637.6 | 123,128.6 | 278.0 | 5,315.2 | 2,883.9 | 71,022.6 | 227,265.9 |

TABLE NS-6

**Indirect Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Productivity Loss**
Nova Scotia, 1999

| Category of Productivity Loss | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|--|--------------------------------------|-----------------|---|------------------|----------------|-----------------|------------------|
| Morbidity Costs | | | | | | | |
| <i>Cases While Hospitalized</i> | 159.1 | 442.3 | 1.0 | 40.7 | 17.9 | 524.2 | 1,185.2 |
| <i>Partial Permanent Disability</i> | 9,787.1 | 23,384.1 | 136.9 | 1,429.4 | 1,588.0 | 26,503.7 | 62,829.2 |
| <i>Total Permanent Disability</i> | 7,277.3 | 11,404.9 | 116.2 | 295.8 | 458.9 | 11,281.2 | 30,834.3 |
| Sub-Total | 17,223.5 | 35,231.4 | 254.1 | 1,765.9 | 2,064.8 | 38,309.1 | 94,848.7 |
| Mortality Costs | | | | | | | |
| Mortality Costs | 31,870.6 | 2,001.7 | 8,444.4 | 2,292.7 | 1,592.8 | 4,004.8 | 50,207.0 |
| Total Costs | 49,094.1 | 37,233.1 | 8,698.5 | 4,058.6 | 3,657.5 | 42,314.0 | 145,055.7 |

TABLE NS-7

**Total Economic Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Productivity Loss**
Nova Scotia, 1999

| Cost Category | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|-------------------------------|--------------------------------------|------------------|---|------------------|----------------|------------------|------------------|
| Direct Costs | | | | | | | |
| <i>Hospitalized Cases</i> | 7,545.4 | 47,553.7 | 38.2 | 1,411.5 | 878.8 | 14,165.1 | 71,592.7 |
| <i>Non-Hospitalized Cases</i> | 2,499.3 | 24,799.0 | 33.1 | 1,916.3 | 717.2 | 22,495.9 | 52,461.0 |
| <i>Disability</i> | 14,592.9 | 50,775.9 | 206.7 | 1,987.3 | 1,287.9 | 34,361.5 | 103,212.3 |
| Total Direct | 24,637.6 | 123,128.6 | 278.0 | 5,315.2 | 2,883.9 | 71,022.6 | 227,265.9 |
| Indirect Costs | | | | | | | |
| <i>Morbidity Costs</i> | 17,223.5 | 35,231.4 | 254.1 | 1,765.9 | 2,064.8 | 38,309.1 | 94,848.7 |
| <i>Mortality Costs</i> | 31,870.6 | 2,001.7 | 8,444.4 | 2,292.7 | 1,592.8 | 4,004.8 | 50,207.0 |
| Total Indirect | 49,094.1 | 37,233.1 | 8,698.5 | 4,058.6 | 3,657.5 | 42,314.0 | 145,055.7 |
| Total Costs | 73,731.7 | 160,361.7 | 8,976.5 | 9,373.8 | 6,541.5 | 113,336.5 | 372,321.7 |

TABLE NS-8

**Summary of Total Economic Costs Resulting from Unintentional Injury
Distribution by Major Cause of Injury**
Nova Scotia, 1999

| Cause of Injury | Total Cost | Direct Cost | Indirect Cost |
|--------------------------|----------------------|----------------------|----------------------|
| Falls | 160,361,677 | 123,128,600 | 37,233,078 |
| Motor Vehicle | 73,731,721 | 24,637,647 | 49,094,074 |
| Poisoning | 9,373,772 | 5,315,216 | 4,058,556 |
| Drowning and Suffocation | 8,976,488 | 277,974 | 8,698,514 |
| Fires | 6,541,488 | 2,883,949 | 3,657,539 |
| Pedal Cycle | 5,981,334 | 3,164,579 | 2,816,756 |
| Water Transport | 1,668,564 | 982,744 | 685,821 |
| Air and Space | 239,616 | 142,165 | 97,451 |
| Railway | 230,474 | 226,049 | 4,426 |
| Other | 105,216,540 | 66,507,022 | 38,709,517 |
| Total | \$372,321,676 | \$227,265,944 | \$145,055,731 |

TABLE NS-9

**Percent Distribution of Total Costs
by Major Category**
Nova Scotia, 1999

| Cause of Injury | Total Cost | % of Total |
|--------------------------|--------------------|-------------------|
| Falls | 160,361,677 | 43.1% |
| Motor Vehicle | 73,731,721 | 19.8% |
| Poisoning | 9,373,772 | 2.5% |
| Drowning and Suffocation | 8,976,488 | 2.4% |
| Fires | 6,541,488 | 1.8% |
| Pedal Cycle | 5,981,334 | 1.6% |
| Water Transport | 1,668,564 | 0.4% |
| Air and Space | 239,616 | 0.1% |
| Railway | 230,474 | 0.1% |
| Other | 105,216,540 | 28.3% |
| Total | 372,321,676 | 100.0% |

TABLE NS-10

Scenario: Population Effects on Economic Costs of Unintentional Injury
Nova Scotia

| Year | Population | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|-------------------|-------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 1999 | 939,236 | \$372.3 | \$227.3 | \$145.1 |
| 2010 | 1,026,828 | \$415.6 | \$264.9 | \$150.7 |
| % Increase | 9.3% | 11.6% | 16.6% | 3.9% |

SENSITIVITY TABLES – NS

Change of Discount Rate

| Discount Rate | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|----------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 3% (Base Case) | \$372.3 | \$227.3 | \$145.1 |
| 5% | \$306.0 | \$198.1 | \$107.9 |
| % Change | -17.8% | -12.9% | -25.6% |

Change of Unemployment Rate

| Unemployment Rate | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|--------------------------|-----------------------------------|------------------------------------|--------------------------------------|
| Base 9.62% | \$372.3 | \$227.3 | \$145.1 |
| 7% | \$377.1 | \$227.3 | \$149.9 |
| % Increase | 1.3% | N/A | 3.3% |

PRINCE EDWARD ISLAND

TABLE PEI-1

**Deaths Resulting from Unintentional Injury
Distribution by Major Category**
PEI, 1999

| Major Cause of Death | Number | % Distribution |
|--------------------------|-----------|----------------|
| Motor Vehicle Crashes | 19 | 44.2% |
| Falls | 14 | 32.6% |
| Drowning and Suffocation | 2 | 4.7% |
| Poisoning | 4 | 9.3% |
| Water Transport | 2 | 4.7% |
| Fires | 0 | 0.0% |
| Air & Space | 0 | 0.0% |
| Other | 2 | 4.7% |
| Total | 43 | 100.0% |

TABLE PEI-2

**Unintentional Injuries Resulting in Hospitalization
Distribution by Major Category**
PEI, 1999

| Major Cause | Number | % Distribution |
|--------------------------|--------------|----------------|
| Falls | 628 | 52.2% |
| Motor Vehicle Crashes | 160 | 13.3% |
| Poisoning | 27 | 2.2% |
| Pedal Cycle | 19 | 1.6% |
| Fires | 15 | 1.2% |
| Water Transport | 4 | 0.3% |
| Drowning and Suffocation | 0 | 0.0% |
| Air & Space | 0 | 0.0% |
| Railway | 0 | 0.0% |
| Other | 350 | 29.1% |
| Total | 1,203 | 100.0% |

TABLE PEI-3

**Unintentional Injuries Resulting in Non-Hospitalization
Distribution by Major Category**
PEI, 1999

| Major Cause | Number | % Distribution |
|--------------------------|---------------|----------------|
| Falls | 6,999 | 36.0% |
| Motor Vehicle Crashes | 931 | 4.8% |
| Fires | 332 | 1.7% |
| Poisoning | 244 | 1.3% |
| Pedal Cycle | 218 | 1.1% |
| Water Transport | 62 | 0.3% |
| Drowning and Suffocation | 0 | 0.0% |
| Air & Space | 0 | 0.0% |
| Railway | 0 | 0.0% |
| Other | 10,662 | 54.8% |
| Total | 19,448 | 100.0% |

TABLE PEI-4

**Unintentional Injuries Resulting in Disability
Distribution by Major Category**
PEI, 1999

| Major Cause | Partial Permanent Disability | Total Permanent Disability |
|--------------------------|---|---|
| Falls | 228 | 17 |
| Motor Vehicle Crashes | 36 | 5 |
| Fires | 7 | 0 |
| Pedal Cycle | 6 | 1 |
| Poisoning | 4 | 0 |
| Water Transport | 1 | 0 |
| Drowning and Suffocation | 0 | 0 |
| Air & Space | 0 | 0 |
| Railway | 0 | 0 |
| Other | 121 | 8 |
| Total | 404 | 31 |

TABLE PEI-5

**Direct Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Expenditure**
PEI, 1999

| Expenditure Category | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|-----------------------------|--------------------------------------|-----------------|---|------------------|--------------|-----------------|-----------------|
| Hospitalized Cases | | | | | | | |
| <i>Hospital</i> | 771.5 | 3,481.5 | 0.0 | 68.9 | 58.2 | 1,397.6 | 5,777.8 |
| <i>Medical</i> | 674.3 | 2,680.3 | 0.0 | 52.5 | 24.0 | 1,113.4 | 4,544.6 |
| <i>Rehabilitation</i> | 48.9 | 174.3 | 0.0 | 6.0 | 1.8 | 98.1 | 329.1 |
| Sub-Total | 1,494.7 | 6,336.1 | 0.0 | 127.5 | 84.0 | 2,609.1 | 10,651.5 |
| Non-Hospitalized Cases | | | | | | | |
| <i>Medical</i> | 288.7 | 3,090.6 | 0.0 | 173.0 | 59.1 | 4,018.7 | 7,630.1 |
| <i>Rehabilitation</i> | 19.3 | 204.1 | 0.0 | 1.2 | 9.5 | 305.2 | 539.2 |
| Sub-Total | 308.0 | 3,294.7 | 0.0 | 174.2 | 68.6 | 4,323.9 | 8,169.3 |
| Permanent Disability | 3,438.9 | 9,963.9 | 0.0 | 311.0 | 298.6 | 8,912.5 | 22,924.9 |
| Total Direct | 5,241.6 | 19,594.7 | 0.0 | 612.7 | 451.3 | 15,845.5 | 41,745.7 |

TABLE PEI-6

**Indirect Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Productivity Loss**
PEI, 1999

| Category of Productivity Loss | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|--|--------------------------------------|----------------|---|------------------|--------------|-----------------|-----------------|
| Morbidity Costs | | | | | | | |
| <i>Cases While Hospitalized</i> | 39.6 | 52.9 | 0.0 | 4.4 | 2.2 | 63.8 | 162.9 |
| <i>Partial Permanent Disability</i> | 1,974.6 | 5,203.9 | 0.0 | 202.3 | 359.1 | 7,264.5 | 15,004.4 |
| <i>Total Permanent Disability</i> | 1,760.3 | 2,543.4 | 0.0 | 23.5 | 103.8 | 2,981.7 | 7,412.7 |
| Sub-Total | 3,774.5 | 7,800.1 | 0.0 | 230.3 | 465.1 | 10,310.0 | 22,579.9 |
| Mortality Costs | | | | | | | |
| | 5,753.0 | 516.0 | 719.0 | 1,554.6 | 0.0 | 954.1 | 9,496.7 |
| Total Costs | 9,527.5 | 8,316.1 | 719.0 | 1,784.8 | 465.1 | 11,264.1 | 32,076.6 |

TABLE PEI-7

**Total Economic Costs (\$Thousands) Resulting from Unintentional Injury
Distribution by Major Cause of Injury and Type of Productivity Loss**
PEI, 1999

| Cost Category | Motor Vehicle Crashes | Falls | Drowning and Suffocation | Poisoning | Fires | Other | Total |
|-------------------------------|--------------------------------------|-----------------|---|------------------|--------------|-----------------|-----------------|
| Direct Costs | | | | | | | |
| <i>Hospitalized Cases</i> | 1,494.7 | 6,336.1 | 0.0 | 127.5 | 84.0 | 2,609.1 | 10,651.5 |
| <i>Non-Hospitalized Cases</i> | 308.0 | 3,294.7 | 0.0 | 174.2 | 68.6 | 4,323.9 | 8,169.3 |
| <i>Disability</i> | 3,438.9 | 9,963.9 | 0.0 | 311.0 | 298.6 | 8,912.5 | 22,924.9 |
| Total Direct | 5,241.6 | 19,594.7 | 0.0 | 612.7 | 451.3 | 15,845.5 | 41,745.7 |
| Indirect Costs | | | | | | | |
| <i>Morbidity Costs</i> | 3,774.5 | 7,800.1 | 0.0 | 230.3 | 465.1 | 10,310.0 | 22,579.9 |
| <i>Mortality Costs</i> | 5,753.0 | 516.0 | 719.0 | 1,554.6 | 0.0 | 954.1 | 9,496.7 |
| Total Indirect | 9,527.5 | 8,316.1 | 719.0 | 1,784.8 | 465.1 | 11,264.1 | 32,076.6 |
| Total Costs | 14,769.1 | 27,910.8 | 719.0 | 2,397.5 | 916.4 | 27,109.6 | 73,822.3 |

TABLE PEI-8

**Summary of Total Economic Costs Resulting from Unintentional Injury
Distribution by Major Cause of Injury**
PEI, 1999

| Cause of Injury | Total Cost | Direct Cost | Indirect Cost |
|--------------------------|---------------------|---------------------|----------------------|
| Falls | 27,910,788 | 19,594,680 | 8,316,108 |
| Motor Vehicle | 14,769,093 | 5,241,596 | 9,527,497 |
| Poisoning | 2,397,497 | 612,669 | 1,784,828 |
| Pedal Cycle | 1,477,446 | 760,531 | 716,915 |
| Fires | 916,355 | 451,261 | 465,094 |
| Drowning and Suffocation | 718,998 | 0 | 718,998 |
| Water Transport | 552,026 | 137,654 | 414,372 |
| Air and Space | 0 | 0 | 0 |
| Railway | 0 | 0 | 0 |
| Other | 25,080,112 | 14,947,287 | 10,132,826 |
| Total | \$73,822,315 | \$41,745,677 | \$32,076,638 |

TABLE PEI-9

**Percent Distribution of Total Costs
by Major Category**
PEI, 1999

| Cause of Injury | Total Cost | % of Total |
|--------------------------|-------------------|-------------------|
| Falls | 27,910,788 | 37.8% |
| Motor Vehicle | 14,769,093 | 20.0% |
| Poisoning | 2,397,497 | 3.2% |
| Pedal Cycle | 1,477,446 | 2.0% |
| Fires | 916,355 | 1.2% |
| Drowning and Suffocation | 718,998 | 1.0% |
| Water Transport | 552,026 | 0.7% |
| Air and Space | 0 | 0.0% |
| Railway | 0 | 0.0% |
| Other | 25,080,112 | 34.0% |
| Total | 73,822,315 | 100.0% |

TABLE PEI-10

Scenario: Population Effects on Economic Costs of Unintentional Injury
Atlantic, 1999

| Year | Population | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|-------------------|-------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 1999 | 137,980 | \$73.8 | \$41.7 | \$32.1 |
| 2010 | 150,848 | \$80.5 | \$46.9 | \$33.5 |
| % Increase | 9.3% | 9.0% | 12.4% | 4.6% |

SENSITIVITY TABLES – PEI

Change of Discount Rate

| Discount Rate | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|----------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 3% (Base Case) | \$73.8 | \$41.7 | \$32.1 |
| 5% | \$58.8 | \$35.0 | \$23.8 |
| % Change | -20.4% | -16.3% | -25.7% |

Change of Unemployment Rate

| Unemployment Rate | Total Cost \$ Millions | Direct Cost \$ Millions | Indirect Cost \$ Millions |
|--------------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 14.08% (Base Case) | \$73.8 | \$41.7 | \$32.1 |
| 11% | \$74.9 | \$41.7 | \$33.2 |
| % Increase | 1.5% | N/A | 3.5% |

APPENDIX B FOUR PROVINCE COMPARISON

| Province | Population | | Total Cost | | Total Cost per capita | | Direct Cost | | Indirect Cost | |
|---------------|------------------|--------------|------------------------|--------------|-----------------------|--------------|----------------------|--------------|---------------|--------------|
| | Population | Distribution | Dollars | Distribution | Dollars | Distribution | Dollars | Distribution | Dollars | Distribution |
| NL | 541,000 | 23% | \$213,450,034 | 18% | \$124,343,321 | 19% | \$89,106,713 | 18% | \$165 | 18% |
| NB | 754,969 | 32% | \$501,623,048 | 43% | \$277,653,506 | 41% | \$223,969,542 | 46% | \$297 | 46% |
| NS | 939,236 | 40% | \$372,321,676 | 32% | \$227,265,944 | 34% | \$145,055,731 | 30% | \$154 | 30% |
| PEI | 137,980 | 6% | \$73,822,315 | 6% | \$41,745,677 | 6% | \$32,076,638 | 7% | \$232 | 7% |
| Totals | 2,373,185 | 100% | \$1,161,217,072 | 100% | \$671,008,448 | 100% | \$490,208,624 | 100% | \$207 | 100% |

| Province | Population | | Motor Vehicle Crashes | | Falls | | All Injuries | |
|---------------|------------------|--------------|-----------------------|-------------------------------------|--------------|--------------------------------|---------------------|---------------------------------------|
| | Population | Distribution | MV Crashes Number | MV Crashes Distribution per 100,000 | Falls Number | Falls Distribution per 100,000 | All Injuries Number | All Injuries Distribution per 100,000 |
| NL | 541,000 | 23% | 36 | 1.4% | 46 | 20% | 128 | 19% |
| NB | 754,969 | 32% | 116 | 4.4% | 81 | 3.6% | 261 | 38% |
| NS | 939,236 | 40% | 94 | 3.5% | 86 | 3.8% | 250 | 37% |
| PEI | 137,980 | 6% | 19 | 7% | 14 | 6% | 43 | 6% |
| Totals | 2,373,185 | 100% | 265 | 100% | 227 | 100% | 682 | 100% |

| Province | Population | | Motor Vehicle Crashes | | Falls | | All Injuries | |
|---------------|------------------|--------------|-----------------------|-------------------------------------|--------------|--------------------------------|---------------------|---------------------------------------|
| | Population | Distribution | MV Crashes Number | MV Crashes Distribution per 100,000 | Falls Number | Falls Distribution per 100,000 | All Injuries Number | All Injuries Distribution per 100,000 |
| NL | 541,000 | 23% | 393 | 1.9% | 1,691 | 18% | 3,453 | 19% |
| NB | 754,969 | 32% | 857 | 4.2% | 3,719 | 40% | 7,870 | 44% |
| NS | 939,236 | 40% | 611 | 3.0% | 3,298 | 35% | 5,486 | 30% |
| PEI | 137,980 | 6% | 160 | 8% | 628 | 7% | 1,203 | 7% |
| Totals | 2,373,185 | 100% | 2,021 | 100% | 9,336 | 100% | 18,012 | 100% |

| Province | Population | | Motor Vehicle Crashes | | Falls | | All Injuries | |
|---------------|------------------|--------------|-----------------------|-------------------------------------|----------------|--------------------------------|---------------------|---------------------------------------|
| | Population | Distribution | MV Crashes Number | MV Crashes Distribution per 100,000 | Falls Number | Falls Distribution per 100,000 | All Injuries Number | All Injuries Distribution per 100,000 |
| NL | 541,000 | 23% | 2,955 | 2.1% | 18,804 | 18% | 56,598 | 19% |
| NB | 754,969 | 32% | 4,743 | 3.3% | 41,438 | 40% | 136,957 | 46% |
| NS | 939,236 | 40% | 5,715 | 4.0% | 36,842 | 35% | 84,057 | 28% |
| PEI | 137,980 | 6% | 931 | 6% | 6,999 | 7% | 19,448 | 7% |
| Totals | 2,373,185 | 100% | 14,344 | 100% | 104,082 | 100% | 297,059 | 100% |

| Province | Population | | Motor Vehicle Crashes | | Falls | | All Injuries | |
|---------------|------------------|--------------|-----------------------|-------------------------------------|----------------|--------------------------------|---------------------|---------------------------------------|
| | Population | Distribution | MV Crashes Number | MV Crashes Distribution per 100,000 | Falls Number | Falls Distribution per 100,000 | All Injuries Number | All Injuries Distribution per 100,000 |
| NL | 541,000 | 23% | 3,384 | 2.0% | 20,541 | 18% | 60,179 | 19% |
| NB | 754,969 | 32% | 5,716 | 3.4% | 45,238 | 40% | 145,088 | 46% |
| NS | 939,236 | 40% | 6,420 | 3.9% | 40,226 | 35% | 89,793 | 28% |
| PEI | 137,980 | 6% | 1,110 | 7% | 7,641 | 7% | 20,694 | 7% |
| Totals | 2,373,185 | 100% | 16,630 | 100% | 113,645 | 100% | 315,753 | 100% |

Note 1: The Atlantic Region was modeled separately from the individual provinces. Due to this, and rounding, the provincial values may not sum to the regional totals.
Note 2: All data from 1999.

APPENDIX C

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APPENDIX D

THE ELECTRONIC RESOURCE ALLOCATION TOOL (ERAT)

The ERAT (Electronic Resource Allocation Tool) consists of a series of spreadsheets designed to calculate the incidence costs of unintentional injury. The tool was created to fulfill two major objectives:

- to supply modeling and estimation techniques required to fill critical gaps in the available data in Canada
- to serve as a resource tool that can be used by researchers and public health officials at provincial and local levels to support resource allocation, policy development and decision-making.

MODELING AND ESTIMATION TECHNIQUES

While evaluating The Economic Burden of Unintentional Injury in Canada, the study researchers discovered significant gaps in data currently available. They found that detailed data are only available for deaths and injuries that result in a hospitalized inpatient stay. Injuries that are not treated in a hospital or are only treated in the emergency/outpatient department are not captured or reported through a central body. Furthermore, there is a large data gap for hospitalized injuries that require on-going care outside a hospital setting for either a short period or for a longer term of permanent disability.

Overall, the data gaps point towards two key analytical challenges:

- estimating the type, number and cost of nonhospitalized injuries
- building the full episode of care for hospitalized injuries resulting in short-term and long-term disabilities.

The analytic strategy used to address these methodological problems involved an extensive search through scientific literature to find numbers and ratios that could be used to fill the data gaps. For example, in an American study the researchers found a ratio of hospitalized to non-hospitalized injury. Since Canada has very good information on hospitalized injury available from the

Canadian Institute of Health Information, the study researchers were able to apply this ratio to produce an estimate of the number and type of non-hospitalized injuries.

THE ERAT: A RESOURCE TOOL

Meeting the second objective was entirely dependent on completing the first objective since the latter was essentially a test of the analytic tool at the national level. In order to enable the application of the tool at other levels, it was necessary to allow for the customization of some parameters in the analytical framework or spreadsheet to reflect local conditions (e.g., population size and mix, injury incidence, etc.). Once adjusted, the tool calculates total costs as well as costs for each injury type. The resource tool has been designed to allow for constant updating of current injury and cost information.

APPENDIX E

METHODOLOGY AND DATA

This study was conducted using an incidence costing approach. That is, the incident population of Atlantic residents injured in 1999 was costed over the lifetime of injured individuals. The costs, both direct and indirect were discounted to a present value in 1999 at 3% per annum. Indirect costs included only foregone earnings calculated as average earnings, adjusted by the participation rate and unemployment rate, over the relevant period within the working-life of an individual from age 18 to 64 inclusive. Data from the Statistics Canada CANSIM database on participation rates, unemployment rates and average earnings was used in these calculations. A real wage growth rate of 1% per year was assumed. Details on the incidence costing methodology are given in *The Economic Burden of Unintentional Injury in Canada*, pp. 15-20.

MORTALITY

Various partners provided mortality data from Vital Statistics. The data file included the number of cases and average age grouped by external causes of death (ICD-9 E-codes), age and gender categories. Population denominators, for the covered population, by age and gender were also provided. Mortality costs were restricted to indirect costs related to earnings lost due to death, over what would have been the remaining working-life of individuals had they lived.

HOSPITALIZED INJURIES

Provincial data sources provided acute hospital separation data for all injury hospitalizations of Atlantic residents. The data included number of cases, average age, average provincial RGN cost, average length of stay, grouped by external causes of injury (ICD-9 E-codes), age and gender categories. Various partners provided population denominators, for the covered population, by age and gender.

Hospital costs were estimated using the average inpatient cost per weighted case, and the inpatient average RGN cost. Medical and rehabilitation costs were calculated using hospital costs in conjunction with the distribution of ICD-9 N-codes by ICD-9 E-codes derived from CIHI hospital data, and Table 5.6 of the *Databook on Nonfatal Injury*.

Indirect costs were limited to lost earnings during hospitalization.

NON-HOSPITALIZED INJURIES

Non-hospitalized injuries were estimated using local hospitalized injuries in conjunction with the distribution of ICD-9 N-codes by ICD-9 E-codes derived from CIHI hospital data, and Table 4.3 of the *Databook on Nonfatal Injury*.

Medical and rehabilitation costs were calculated using the provincial hospital costs in conjunction with the distribution of ICD-9 N-codes by ICD-9 E-codes derived from CIHI hospital data, and Tables 5.6 and 5.9 of the *Databook on Nonfatal Injury*.

DISABILITY

Partial permanent and total permanent disability from injury was estimated using both hospitalized and non-hospitalized injury in conjunction with the distribution of ICD-9 N-codes by ICD-9 E-codes derived from CIHI hospital data, and Tables 4.12 and 4.15 of the *Databook on Nonfatal Injury*.

Long-term medical costs were calculated using hospital costs in conjunction with Tables 3.1 and 3.2 of the *Databook on Nonfatal Injury*, while the indirect cost associated with income loss was assumed to be 100% for total permanent disability, and 17% for partial permanent disability.

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